



VOL. 45, No. 7

JULY 1977

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COVER PHOTO

At the opening of the new rooms of the VK5 Division at Thebarton in April, Phil VK5NN demonstrates part of the equipment at VK5BW to Dr. Flaherty (left), Mayor of Thebarton Corporation, Divisional President VK5ZK (right) looks on.

— Photo by Christine M. Mahony



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A fully ruggedly constructed this model is particularly suitable for workshops. It features special scales for measurement of capacitance and inductance. Diode protected movement.
Specifications: 20,000 ohm/volt DC, 6,000 ohm/volt AC. DC volts — 0.25; 1; 2.5V; 10; 50; 250; 1,000; 5,000; AC volts — 10; 50; 250; 1,000; DC amps: 50 μ A; 1 mA; 50 mA; 500 mA; 10 A. Ohms — 4 K ohm; 400 K ohm; 4 M ohm; 40 M ohm. Centre scale — 40 ohm; 4,000 ohm; 400,000 ohm. Decibel: —20 to +62 db. Dimensions: 6" x 4-1/2" x 2"; 162 x 107 x 31 mm. Inductance — 0/5000H. Carrying case available, Model C \$6.90.

\$29.90 Postage \$2.20

MODEL CT-500/P MULTIMETER

Of intermediate size, this popular multimeter combines high accuracy with versatility over 24 ranges. Mirror Scale. Diode protected movement.

Specifications: 20,000 ohm/volt DC; 10,000 ohm/volt AC. DC Volts: 2.5, 10, 50, 250, 500, 5,000; AC Volts: 10, 50, 250, 500, 1,000; DC Amps: 0.05 mA, 5 mA, 50 mA, 500 mA. Ohms: 12 ohm, 120 ohm, 1.2M ohm, 12M ohm. Centre Scale: 60 ohm, 600 ohm, 6k ohm, 60k ohm. Decibel: —20 to +62 db. Dimension: 5 1/2 x 5-5/8 x 1 1/2 inches. Carrying case available, Model B — \$5.90.

Price: \$27.90 — Postage \$2.20.

MODEL A5100 D/P MULTIMETER

This meter features double zero diode meter protection and 3 1/2" full view easy to read 2 colour scale. It is fitted with polarity reversing switch and housed in a strong moulded case with carrying handle.

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amateur radio



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QSP NATIONAL SECRETARIAT OF WIA CANBERRA — WHEN?

A special committee of the ACT Division has been set up to examine the feasibility of
acquiring a suitable site and building for a National Headquarters, and has sent
Executive a proposal for acquiring this under very favourable terms.

Essentially these are —

- (1) A site opposite the Royal Mint in Deakin.
- (2) A 50 year lease under less stringent financial terms than a commercial lease.
- (3) Permission to sublet half of any buildings the Institute erects.
- (4) To commence building within 12 months.
- (5) To complete building within 30 months.
- (6) Building must not cost less than \$100,000.
- (7) Building must have a minimum gross floor space of 450m, and a maximum of 900m.

Federal Convention has a policy which calls for a move of Executive to Canberra
when the P & T Department is moved. Although this is not at present contemplated as
far as we can determine, it may not be possible to find a suitable site under such
favourable terms when the time comes.

In addition the Committee has found a very suitable prospective tenant very interested
in the sublease. This tenant's operation is compatible with the WIA. The National Capital
Development Commission is pressing for a decision, and the prospective tenant is
anxious to know our intentions.

Long term the financial outlook is very favourable, but our immediate need if we
decide to go ahead, is for the "deposit gap", say \$75,000 in our case. Executive and
Council will have to make a decision, one way or the other, before this QSP reaches
members. The whole matter will be thoroughly debated and our needs for the immediate
future taken into consideration, but we trust that you, the members, will respond adequately
should it be decided that we go ahead.

**K. V. ROGET VK3YQ,
Federal Treasurer (Hon.).**

WIRELESS INSTITUTE OF AUSTRALIA

WIRELESS INSTITUTE OF AUSTRALIA

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Executive Office: P.O. Box 150, Toorak, Vic., 3142.
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President — Mr. S. W. Grimley VK1VK
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NSW:

President — Mr. T. I. Mills VK2TDM
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Broadcasts — 1825, 3595, 7140 MHz, 27.125, 28.5,
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2m 558 and 2m Ch. 2 repeater: 09.30Z
— also on Radio 3CR Mondays 10.15
and 3 HA).

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VK3 — 412 Brunswick St., Fitzroy, 3065 (Ph. (03)
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VK4 — G.P.O. Box 930, Brisbane, 4001.

VK5 — G.P.O. Box 1234, Adelaide, 5001 — HQ at
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294 7442).

VK6 — G.P.O. Box N1002, Perth, 6001.

VK7 — P.O. Box 1010, Launceston, 7250.

VK8 — (Incl. with VK5), Darwin AR Club, P.O. Box
1418, Darwin, 5784.

Slow wave transmissions — most week-day even-
ings about 09.30Z onwards around 3580 kHz.

WIANEWS

NOVICE EXAMS

A telex from central office received during May advised representations had been made that the November Novice examination date coincided with school examinations. Consequently the November theory and regulations Novice exam date is advanced to Tuesday, 25th October, 1977. Applications should be made by 16th September.

It was also stated that if the new date proves satisfactory this year consideration will be given to holding the Novice exams from next year on the 3rd Tuesday in April and October. If anyone wishes to make any comments on this please write to the Executive Office, Toorak.

The November Novice Morse exam date however remains unchanged as Tuesday, 15th November, the same date for all grades Morse exam. Closing date for applications remains unchanged as 1st November.

NOVICE EXAM SYLLABUS

Graeme Scott VK3ZR, the Federal Education Co-ordinator, writes to say that "Since the publication of the first syllabus from Roger Davis VK4AAR in April, a further revised copy has been received by the Executive. This revised edition was a joint effort by Roger, Rex Black VK2YA, Ken Hargreaves VK2AKX, Keith Howard VK2AKH and a number of other interested amateurs.

The revised syllabus has been forwarded to the P & T Department, RFMD, for comment and ultimate official adoption. Once the Department has responded, the finally accepted version of the syllabus is intended to be published in AR.

Executive considers that the best approach is to hold the printing of the revised syllabus until central office has examined and accepted it.

One unofficial comment from the Department to me by telephone was that the syllabus is a very comprehensive one and doubts were expressed that it could be a little high in level. I reassured the Department that this was always under review but a syllabus can only outline fully what SHOULD be taught in a course. The depth of coverage is up to the individual teacher's discretion. Furthermore, the examiner has a wider scope for questions on a comprehensive syllabus, however he should only probe to what is considered a fair depth when framing his questions. We are not ALL graduates in the amateur radio world!

CALL BOOK

Work is proceeding on the 1977 Call Book. A number of problems arose with changes to the computer programme which now appear to have been overcome. It is anticipated that call sign details for members will be correct up to mid June and for non-members up to February 1977. Delivery to retail outlets should occur late in July or early August. Printing costs estimates have not been completed hence the cover price cannot be finalised yet.

QSP

DANGER — HIGH MOBILE ANTENNAE

During the last week in May, a fault developed on an State Electricity Commission's 22 KV system on a feeder from Croydon to Mt. Dandenong (Vic.)

The fault operated the circuit breaker at Croydon and power was lost to an area including the TV transmitters at the mountain top.

A patrol of the line was made, and at the end of the 22 KV line at Mt. Dandenong the fault was found—a "CB" antenna was found welded to the HV conductors, and hanging in mid air. The antenna had been burnt off at the base where it was originally attached to a vehicle, and obviously the vehicle had driven off, possibly at high speed, with a very disturbed "CB" operator driver at the wheel, and possibly minus a "CB" transceiver in doubtful state of repair.

This item is brought to your notice, not only for CDBers but for Amateurs also. The DANGER of high mobile antennas is considerable when in proximity to overhead power systems.

Hopefully, the CBER involved suffered no injury, but was only frightened by this incident.

The USA has had 125 fatalities so far from "CB" antennas fouling overhead systems.

Please, fellows, watch the height of your mobile antenna and live to work some more DX.

— From VK3JAN.

SCALAR for Antennae

Amongst the comprehensive range of SCALAR ANTENNAE there are some of special interest to the Radio Amateur.

These include our VHF and UHF, C.B. Range, HF Mobile and Base Station Units for Land and Marine applications, for example . . .

Model M25

For more efficient 2-metre performance use the SCALAR M25. A 3 dB gain mobile, designed for use in the 140-175 MHz band. The antenna is a 5/8 wavelength whip complete with integral loading coil. Constructed of fibreglass, these antennae combine resilience with non-ferrous continuity for high quality performance and noise free operation.

and SCALAR'S OWN . . .
"MAGNABASE" Model MBG



This high quality magnetic base may be fitted with any SCALAR whip. Instant installation on any flat metal surface. Fully protected for scratch-free mounting. Complete with 12 feet of RG58CU coaxial cable.



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Trade Enquiries: NSW: 570-1392 VIC: 725-9677

UK EXAMS

"The Radio Amateurs' examination (City and Guilds of London Institute) from 1979 will be in the form of objective tests containing multiple-choice questions. In the preparation for this change it is the Institute's policy to pretest objective questions, trying them out on candidates who have reached examination standard. Pretests are intended to test the performance of individual questions and syllabus coverage. Information is obtained which assist the Institute's reviewing panels in judging whether each individual question should be included in the question bank for use in future examinations."

Short Wave Magazine, April 1977.

28 MHz BEACONS

"The (International Beacon) project continues to advance steadily and to meet the recommendation of the Warsaw (IARU Region 1) Conference that beacons should be at the 28.2-28.25 MHz portion of the band, it is being suggested to the national societies and other responsible bodies that the new frequencies should be planned on a 'mirror image' above the common frequency of 28.2 MHz instead of the present allocation which is below 28.2 MHz." The following is a list of IMP 28 MHz beacons in use showing the past and proposed frequencies:—

	Old	New
DL0IG—W. Germany	28.195	28.205
3B8MS—Mauritius	28.190	28.210
GB3SX—UK	28.185	28.215
5B4CY—Cyprus	28.180	28.220
VE3TEN—Canada	28.175	28.225
ZL2MHF—NZ	28.170	28.230
VP9BA—Bermuda	28.165	28.235
A9XC—Bahrain	28.155	28.245
WA1IOB—USA	28.150	28.250

A number of other beacons are under construction or being planned to slot into the recommended 2.5 kHz spacing. These are:—

8J2BBB—Zambia	28.2025
W4—USA	28.2075
ZD9GI—Gough Is.	28.2125
2K2WI—NSW	28.2175
YU—Yugoslavia	28.2225
F3THF—France	28.2275
PT1YK—Brazil	28.24
O44VHF—Peru	28.185

* Being reconstructed.

Source — IARU RI News, May 1977.

RECIPROCITY — POLAND

IARU RI News, May 1977, reports that guest licence applications may come from any country but reciprocal agreements are in force between Poland and the UK and Canada. Allow three months for processing, send copy to PZK, the Polish Amateur Society, no charge for licence and no mobile provisions.

MEDIA PUBLICITY

Ever thought about publicity for amateur radio activities? Have a look at what the ARRL Public Information Office wrote in April QST and ponder the situation as it affects us in Australia. "How many times within the last six weeks have you picked up a newspaper that carried at least one story on CB? You probably said to yourself, 'Why don't amateurs get the same coverage?' There are many reasons, some of which have to do with sheer numbers and the economics of the media. Some of it has to do with old attitudes and bad habits."

For example, suppose that we create a mythical disaster—swamp draining: Early one morning Providence decides that it is time to drain the swamp. Draining the swamp, of course, disrupts normal communications; therefore, amateurs wade in to help the victims of the swamp draining. The news media's habit of not listening and asking a reporter out to find out what is going on. Maybe he stumbles across the amateur and maybe he doesn't. If the reporter does find the amateur, he starts to ask a lot of questions. Meanwhile the amateur is up to his knees in alligators and lets the reporter to find some quicksand and go swimming.

Two weeks after it is over the amateur calls the reporter and asks if he needs more information. The reporter tells him that the story has no news value now and to call him the next time amateurs are involved in a swamp draining. The amateur then sends the details into QST, which immediately prints the story. Everyone is happy and satisfied on the back and we all rest assured that 150,000 amateurs know how that amateur did a good job!

LINEAR AMPLIFIER BAN—USA

FCC dockets 21118 and 21117, according to an article in April 1977 QST contain proposals to ban the manufacture and sale of external power amplifiers capable of operating on any frequency between 24 and 35 MHz and (21117) would put all commercially manufactured transmitters and external power amplifiers under the FCC's type-acceptance program. "If you're wondering what amateur have done to make the FCC want to ban 10 metre amplifiers, you're headed in the wrong direction," says the article. "The problem is not with the amateur but with the FCC's attitude towards these amplifiers in the CB service. A recent FCC study of 90 random TVI cases found that 60 per cent involved the illegal use of amplifiers by CBers. To compound the problem, some manufacturers and dealers appear to be catering to this illegal market." "It is improper to take privileges away from a service known for its good operating practices and self-discipline in order to control illegal practices in another separate and distinct service." The article suggests that these are alternatives to this heavy-handed action. Provisions are in the dockets exempting home-built, custom amateur linear and personal amplifiers. (Please refer to paragraph numbered 8 under "CB" in AR June 1977, page 5—Ed.)

USA SITUATION

April QST editorial comments on the discontinuance of fees for radio licence applications in the USA from 1-1-1977. FCC is faced, it says, with an ever-increasing flood of work—caused mainly by more licence applications and the need for more enforcement of the regulations. Some 980,000 CB applications and 21,500 amateur applications were received by the FCC in the month of January 1977 alone. The FCC, despite all this, has not been able to obtain approval of a budget large enough to cope. In order to survive, the FCC licence-issuing process has been streamlined so that it costs less than a dollar to issue a CB licence and many of the recent actions taken and proposed by the FCC were designed to reduce the cost of regulating the amateur service. "New programs, even though beneficial to the amateur service, can't be considered at this time, according to the Commission, because to implement the programs would cost money, and there is no money." The licence fees which were collected went directly into the general fund of the USA and the FCC had to work on a budget that may have been less than the fee receipts and was generally inadequate. The ARRL believes that radio licence fees ought to be channelled back directly to FCC or a more realistic budget should be authorised.

CAVEAT EMPTOR

A quote from ARNS Bulletin of March 1977 taken from a radio club publication by W9QKE describes the painstaking work involved in putting together a device which in the end never worked. Why? Because a check on the transistors and IC's used showed several were not only defective but were other than stated on the covers. It seems there are unscrupulous dealers around who purchase scrap lots for re-marking or re-labelling in counterfeited style. Now you know.

FIL LICENSING

An article by ZL2SS in Break-In May 1977 advises that anyone visiting 3D2 and wanting to operate should apply to the P & T Department, Box 40, Sore, at least two months beforehand. The usual policy is to check on your own licence. A temporary licence is required and the licence fee was \$1 for a week or \$4 for a year. After applying you will be asked to complete a long application form and supply two character references. Applications from non-British subjects require the special approval of the Minister which is understood to be difficult to get. Also required will be details of the gear you wish to take into Fiji, for which an import permit is necessary to qualify for duty free admission as transceivers (but not radio receivers) are liable to duty. If all goes well you would then wait a couple of weeks for your licence. A temporary licence to be collected personally when you arrive.

DIGITAL COMMUNICATIONS

The Canadian special edition of the ITU Telecommunications Conference of March 1977 contains much interesting information on modern techniques on information transfer which are inherently either analogue (speech generates a continuous waveform) or digital (teletypewriters emit pulses). Thus the telephone is an analogue device from the very beginning but digital communications have been with us for a very long time in the form of morse code, N. American Indian smoke signals, drums of Africa, etc. Modern technology has only recently become available for high-speed digital processing. There is little doubt that past evolution in telecommunication has been nothing compared to the revolution now well under way and the more radical developments promised for the future, states an article on Digital Telecommunications. The article goes on to state there are two sets of world digital standards recognised by CCITT: one based on the binary's primary level multiplex of N. America and Japan, and the other on the 2048 Kbit/s primary level multiplex used extensively in Europe. The common foundation for both standards is the 8000 Hz sampling rate of the voice channel and the resulting 64000-bit rate for encoded speech. The importance of the work going on in CCITT to reduce differences between both sets of standards is aimed to facilitate system interworking having regard to the enormous outlays in capital equipment involved.

HfAirs

April 1977 QST reports an FCC public notice about persons using SSB on various frequencies, particularly between 27.4 and 28.0 MHz, with equipment intended for amateur radio and using false call signs. The FCC considers out-of-band operation a major enforcement issue and has designated for hearing the application of John H. Randall, president of HF International (one of the SSB groups referred to in the notice) for renewal of a CB service licence. The call for the hearing mentions a number of illegal activities urged or condoned by HF International and its publication.

CANADIAN QUALIFICATIONS

DGC has proposed a clarification of the classes of examination privileges required to qualify persons as operators of amateur radio stations. Holders of 1st and 2nd class radio operators' certificates, special radio operator's certificate, advanced amateur radio operator's certificate or an amateur radio operator's certificate are to be permitted to operate amateur radio stations. March 1977 QST.

COMPONENTS PRICES VARIATION

Due to possible design currency rate fluctuations in costs related to the import and supply of components purchased from the VK3 Division, it is possible that the prices quoted on the order form could change without notice.

A SOLID STATE VIDEO MODULATION SYSTEM

G. C. Brown VK3YGB
18 Hedderwick Street, Essendon, 3030

This unit provides video and sound modulation for either a solid state or valve transmitter. Sound modulation is achieved by use of a 5.5 MHz subcarrier injected in with the video.

The resulting spectrum produced by the transmitter is two video sidebands with carrier, plus two sound subcarriers (FM) displaced 5.5 MHz either side of the vision carrier. This output is suitable for reception of sound and vision using a standard domestic television receiver with an appropriate frequency converter.

The video modulator, Fig 1, consists of an isolator stage, an adjustable clamp (black level set) and a wideband DC amplifier. The 5.5 MHz FM sound signal is produced by a free running oscillator and a varicap diode as shown in Fig 2.

Option A, for a solid state transmitter, has been in use for over three years in a 16 watt 70 cm ATV transmitter. Results over this period have been good and operation mobile/portable using a 12V battery, as well as from the home station has produced favourable reports.

Output from the modulated RF power amplifier may be fed into a varactor diode tripler to enable operation on other bands. The tripler retains the relationship between the sidebands, carrier and subcarriers while providing an overall frequency shift. This mode of operation has produced excellent results on both the 70 cm and 23 cm bands.

Option B provides a means of modulating a valve transmitter. The valve may be in the grounded grid configuration as is the case with the APx6 transponders. This modulator has been used successfully with a modified APx6 as a tunable 23 cm ATV transceiver.

Adjustment of the black level is best done with a greyscale generator, demodulator probe and CRO, but any video signal may be used. Injection level for the sound signal may also be monitored using the above equipment. The correct ratio for

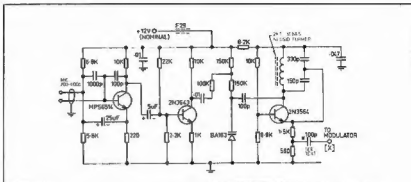


FIG. 2. SUBCARRIER GENERATOR, 5.5 MHz (PCB UNIT)

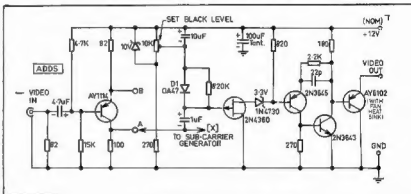


FIG. 3. VIDEO MODULATOR (PCB UNIT)

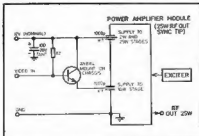


FIG. 4. OPTION A — TO MODULATE SOLID STATE TRANSMITTER

peak vision to sound power is 10:1 and may be set by varying the values of the 100 pF coupling capacitor to the modulator.

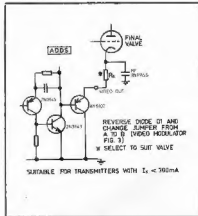


FIG. 5. OPTION B — TO MODULATE VALVE TRANSMITTER

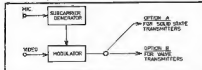


FIG. 1. BLOCK DIAGRAM

A WEATHERPROOF 2 METRE GROUND PLANE

John Kolm VK3YJK

Described here is an unusual construction method for a conventional ground plane antenna.

Advantages include complete weather protection for the point of connection to the antenna, extreme ease of attachment to the mast, physical strength, and a very low SWR.

The feed impedance of the aerial has been raised to 50 ohms (for 52 ohm coax) by the fairly conventional method of lengthening the radiating element and resonating this introduced inductance with a capacitor in parallel (see Fig 1). The same method can be used to yield a feed impedance of 75 ohms, using numerical values from the ARRL Antenna Handbook. Below are given numerical values for the ground plane for the 2 metre band, with a feed impedance of 50 ohms.

Length of radiating element: 53.4 cm.

Length of each radial element: 48.9 cm.

Resonating capacitor: 14 pF. Use a 3-33 pF variable of the "beehive" type.

The constructor will require approximately 3 metres of 3/8 inch aluminium tubing, three solder tags, five very small nuts and bolts, one SO-239 type coaxial UHF panel socket, and the capacitor mentioned above. Also required will be approximately 80 cm of polythene tubing with a wall thickness of at least 5 mm to ensure rigidity and an internal diameter fractionally larger than the external diameter of the mast on to which it will fit, as well as a small amount of at least 3 mm thick polythene sheet. Polythene (polyethylene) MUST be used if stray capacitance problems are to be avoided.

The first step is to seal one end of the polythene tube, with a disc cut from the polythene sheet. Since this seal must be completely waterproof, it is advisable to try and get it done with the proper equipment. Failing this, a good seal can be made by placing a thin sheet of hot metal (not too hot) at the points where the two plastic surfaces are to be joined, and causing the surfaces to melt into one another. This seal should be tested. Figure 2 should be referred to for the rest of this article.

Carefully cut two discs out of the polythene sheet. One disc should fit tightly inside the polythene tube, and the other should fit snugly but not tightly. Through the centre of the looser-fitting disc, drill a hole slightly less than 3/8 inch in diameter, so that the aluminium tubing fits very tightly inside it. Put this disc aside for future reference. Through the centre of the tighter-fitting disc, drill or cut a hole large enough to fit the barrel of the coaxial panel socket. Push the socket into the hole so that the flange of the socket is on the TOP side of the disc (see Fig 2), and drill holes through the disc to accommodate the socket mounting bolts.

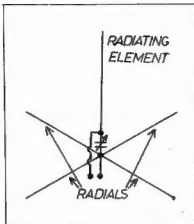


FIG. 1

Refer to figure 3 in this section. Cut the radiating element to length, 1 cm from one end, drill a bolt-sized hole right through both walls of the tube, and drill an identical hole 5 mm from the same end. Solder the centre point of a 5 cm length of flexible wire to the centre connector of the coaxial panel socket, and thread the ends of the wire through the lower set of holes (see Fig 3). Put a bolt straight through the upper set of holes, and use it to bolt one solder tag to either side of the

aluminium tube. Solder the ends of the wire to these solder tags, and cut off the excess (see Fig 3).

Drill two holes in the polythene discs to accommodate the centre and outer lugs of the beehive capacitor (see Fig 2). Insert these lugs (from the BOTTOM side of the disc), and use stiff wire to solder the centre lug to one of the solder tags on the radiating element. Place a solder tag where one of the coaxial socket mounting bolts will eventually bolt it, and solder a wire from this tag to the outer lug of the beehive capacitor (see Fig 2). Keep all wires as short as possible.

Drill four holes in the walls of the polythene tube, 20 cm from one end. These holes should tightly fit the 3/8 inch aluminium tubing, and they MUST be at right angles to each other (see Fig 2).

Cut the radial elements to length. Drill

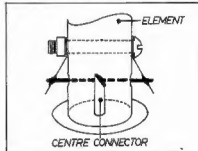


FIG. 3

a bolt-sized hole through each element, 3 mm from one end. Push a nut into the end of each tube until the hole in the nut lines up with the holes in the tube (see Fig 4). Push the four coaxial socket mounting bolts through the polythene disc and through the holes in the socket flange, but do not let them protrude from the flange (i.e. push the bolts only PART WAY in).

Push the polythene discs with the 3/8 inch hole on to the free end of the radiating element, and about 5 cm down (see Fig 2). Pick up the completed assembly

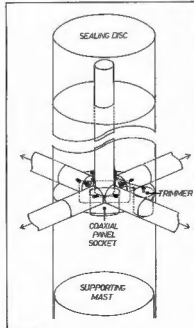


FIG. 2

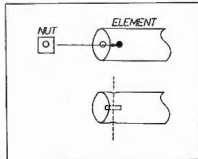


FIG. 4

ELECTRONIC ENTHUSIASTS EMPORIUM

POPULAR INTEGRATED CIRCUITS IN STOCK

CA3012	4.60	CD4026	3.30	CD4724	3.85	LM3801	2.75	MC1496K	2.75	UAA180	3.25
CA3013	5.80	CD4027	1.85	CD40097	1.80	LM3811N	3.20	MC1590G	6.75	UA723C	LM723
CA3018	3.50	CD4028	1.80	CD40098	1.80	LM3821N	2.60	MC1553	12.50	UA757	3.80
CA3023	5.00	CD4029	2.65	CD40174	2.90	LM3875	2.75	MC1648P	4.80	ULN2803	2.45
CA3024	2.80	CD4030	9.95	CD40175	2.90	LM3876	2.90	MC1648P	4.80	ULN2803	2.45
CA3035	5.20	CD4031	4.70	CD40182	2.90	LM3555CN	1.20	OM802	3.20	ULN2111	2.10
CA3039	2.10	CD4035	2.35	CD40184	2.90	LM555AH	1.95	SAJ110	2.50	74C01	.55
CA3040	LM3040	CD4040	2.50	CD40185	2.50	LM555AH	1.95	SAJ110	2.50	74C01	.55
CA3053	3.80	CD4041	2.50	DM8097	1.90	LM555B	10.90	SD3050E	1.30	74C04	.55
CA3059	8.40	CD4042	.95	HEF	see "CD"	LM555N	3.50	SD3050E	1.50	74C10	.85
CA3060	8.40	CD4043	1.25	LM0070	6.20	LM555CN	2.50	SL415A	2.70	74C14	2.60
CA3072	4.40	CD4044	1.95	LM114H	4.90	LM555CN	2.50	SL415A	2.70	74C14	2.60
CA3080	2.10	CD4045	3.20	LM301AN	.95	LM709N	.95	SL437D	3.60	74C85	3.90
CA3081	2.70	CD4046	3.20	LM301CN	.95	LM710CN	1.25	SL440	1.90	74C86	2.00
CA3082	2.70	CD4047	1.95	LM304H	3.80	LM710CN	1.25	SL442	2.90	74C90	2.50
CA3083	2.90	CD4049	.80	LM305AH	3.90	LM723H	1.70	SL447	4.90	74C15A	5.70
CA3086	LM3086	CD4050	.90	LM307N	1.60	LM723N	1.25	SL448	1.60	74C180	3.60
CA3088E	2.90	CD4051	2.25	LM308N	2.20	LM725N	5.90	SL610C	7.25	74C182	4.50
CA3090	8.80	CD4052	2.25	LM309K	2.80	LM733CH	2.70	SL612C	7.25	74C174	2.50
CA3091	18.00	CD4053	2.25	LM310N	3.90	LM733N	2.50	SL613C	12.50	74C192	2.80
CA3125E	4.50	CD4056	1.45	LM311A	3.60	LM741CH	1.20	SL620C	9.50	74C801	1.95
CA3127E	4.50	CD4058	.75	LM311H	3.90	LM741CH	.75	SL621C	9.50	74C825	16.70
CA3128E	9.80	CD4060	.60	LM312H	4.90	LM747CH	1.20	SL623C	17.40	80C35	2.20
CA3130T	2.25	CD4070	.55	LM317K	6.80	LM747CN	2.50	SL622C	26.90	NR8C	
CA3140T	2.25	CD4071	.55	LM318H	6.80	LM748CN	1.20	SL616C	8.80	OL354	1.50
CA3800	2.30	CD4072	.85	LM319H	7.25	LM313CN	3.90	SL630C	8.00	OL448	1.80
CD4000	.55	CD4073	.55	LM319H	7.25	LM313CN	3.90	SL640C	10.60	GL2523	.90
CD4001	.55	CD4078	1.25	LM320K	5.90	LM4538N	2.50	SL641C	10.60	OL31	.90
CD4002	.55	CD4078	1.25	LM320K	5.90	LM4538N	2.50	SL641C	10.60	OL31	.90
CD4006	2.30	CD4081	.58	LM322N	4.50	LM4698N	6.75	SL901B	3.90	RL5023	.35
CD4007	.55	CD4082	.55	LM323K	7.90	LM4698N	1.90	SL917B	6.50	FNDS37	3.50
CD4008	2.35	CD4083	1.65	LM324H	6.80	LM4698N	1.90	SL917B	6.50	FNDS37	3.50
CD4009	1.30	CD4088	1.65	LM325N	4.50	LM5032N	CA3028	SL918B	1.60	FNDS50	3.50
CD4010	1.50	CD4083	1.80	LM326H	4.50	LM5034H	3.60	SP850S	8.80	9268	3.85
CD4011	.55	CD4502	2.70	LM339N	3.70	LM5066	3.75	SP851T	12.50	9601	2.90
CD4012	.55	CD4503	2.70	LM339N	3.70	LM5066	3.75	SP851T	12.50	9601	2.90
CD4013	.90	CD4510	3.20	LM340T	2.70	LM5090S	3.90	T8A570	2.90	NSH74	2.90
CD4014	2.40	CD4511	3.30	LM349N	4.50	LM5090S	1.50	T8A700	4.90	TL306A	
CD4015	2.40	CD4512	3.30	LM349N	4.50	MC1035P	3.90	T8A810A	3.90	TL306A	
CD4018	.90	CD4515	6.50	LM370H	4.95	MC1312P	4.90	T81753A	3.90	SH940	14.50
CD4017	2.25	CD4518	3.90	LM371N	3.90	MC1314P	6.90	TCA220	2.25	2102-2	3.75
CD4018	2.25	CD4518	3.90	LM372H	3.90	MC1315P	10.75	TCA290A	4.80	2513N	17.60
CD4019	2.25	CD4519	3.90	LM372H	3.90	MC1315P	10.75	TCA290A	4.80	2513N	17.60
CD4020	2.50	CD4520	2.55	LM373N	4.70	MC1351P	3.90	TCA380	6.50	SS0242	15.00
CD4021	2.25	CD4526	1.80	LM374N	4.90	MC1454G	5.40	TCA730	6.90	MA1002	13.00
CD4022	2.15	CD4527	1.80	LM375N	4.90	MC1454G	5.40	TCA730	6.90	MA1002	13.00
CD4023	.85	CD4536	1.80	LM377N	3.50	MC1468L	6.50	TDA1005	5.50	7824CP	
CD4024	1.75	CD4536	1.80	LM377N	3.50	MC1468L	6.50	UAA170	3.25		
CD4025	.55	CD4720	12.80			MC1488	LM1488	UAA170	3.25		

In some cases pin for pin substitutes will be supplied.

POPULAR SEMI-CONDUCTORS STOCKED

7401	.48	7483	2.35	74LS258	4.75	74LS174	2.70	BD238	1.90	2N3586	.95
7402	.48	7485	2.35	74LS186	7.50	74LS175	2.70	BD237	2.80	2N3588	.95
7403	.48	7486	.85	82S23	3.95	74LS181	6.50	BD438	2.80	2N3599	.50
7404	.48	7487	4.50	82B1A	3.80	74LS181	6.50	BF173	1.25	2N3638	.55
7405	.48	7488	4.50	74S08	7.50	74LS181	6.50	BF173	1.25	2N3638	.55
7406	.48	7489	1.90	74LS200	.55	74LS183	4.50	BF194	.85	2N3643	.55
7407	1.09	7492	1.20	74LS01	.55	74LS194	2.60	BF200	1.30	2N3643	.55
7408	1.09	7493	1.20	74LS02	.55	74LS195	2.60	BFY50	1.30	2N3694	.65
7409	.48	7494	1.20	74LS03	.55	74LS196	2.60	BFY50	1.30	2N3694	.65
7410	.48	7495	1.65	74LS04	.55	74LS221	2.50	BPX25	4.90	2N3819	1.35
7411	.48	7496	2.15	74LS08	.55	74LS253	3.75	BDX18	.75	2N3906	2.75
7412	1.15	74100	.54	74LS09	.55	74LS253	3.75	BDX18	.75	2N3906	2.75
7413	1.15	74107	.95	74LS10	.60	AC125	1.80	MEF131	1.95	2N4249	.65
7414	1.15	74121	1.20	74LS11	.55	AC126	1.80	MJ802	8.80	2N4250	.65
7415	1.00	74122	1.20	74LS13	1.20	AC127	1.80	MJ2955	2.60	2N4355	.65
7416	1.15	74123	1.40	74LS14	1.20	AC128	1.80	MJ4502	8.80	2N4356	.65
7420	.48	74132	1.90	74LS20	.55	AC132	1.50	MPF102	.65	2N4380	.95
7422	1.95	74141	2.75	74LS21	.55	AC187	1.50	MPF103	.65	2N4545	.75
7423	.75	74145	.95	74LS28	.80	AD168	1.50	MPF104	.65	2N4545	.75
7426	.75	74180	3.25	74LS27	.80	AD148	2.80	MPF105	.65	2N4545	.75
7427	.65	74151	2.20	74LS28	.60	AD181/62	.50	MPF106	1.15	2N4545	.75
7428	.65	74153	.40	74LS29	.55	AS327	.40	MPF107	1.15	2N4545	.75
7432	.65	74154	3.20	74LS30	.70	AS327	.40	MPF108	1.15	2N4545	.75
7437	.90	74157	1.90	74LS37	.70	ASB17	2.65	MPF109	1.15	2N4545	.75
7438	.90	74160	2.75	74LS38	.70	BC107	.95	MPF13C	1.30	2N5591	11.30
7440	2.80	74104	.85	74LS39	.80	BC108	.95	MPF13C	1.30	2N5591	11.30
7441	2.80	74165	2.90	74LS42	2.20	BC109	.95	MPF13C	1.30	2N5591	11.30
7442	2.60	74174	2.90	74LS73	.75	BC177	.95	MPF141	1.70	OA47	.85
7443	2.60	74180	2.90	74LS74	.90	BC178	.95	MPF255	1.70	OA91	.85
7445	2.60	74181	.55	74LS75	1.20	BC179	.95	MPF255	1.70	OA91	.85
7447	2.60	74185	4.90	74LS78	.75	BC182	.40	TT800	2N4037	5852-2800	3.20
7448	2.60	74190	3.90	74LS96	.95	BC212	.55	TT801	1.20	40440	2N3731
7449	2.60	74191	.80	74LS98	.80	BC212	.55	TT801	1.20	40440	2N3731
7451	.48	74192	1.95	74LS92	1.95	BC337	.55	TT801	1.20	40440	2N3731
7453	.48	74192	2.75	74LS92	1.95	BC337	.55	TT801	1.20	40440	2N3731
7454	.48	74193	2.75	74LS92	1.95	BC337	.55	TT801	1.20	40440	2N3731
7460	.48	74194	2.50	74LS109	.85	BC548	2.50	TT801	1.20	40440	2N3731
7470	.85	74195	1.90	74LS113	.85	BC558	.55	TT801	1.20	40440	2N3731
7472	.75	74196	2.90	74LS114	.85	BC639	1.20	TT801	1.20	40440	2N3731
7473	.75	74200	2.90	74LS115	2.60	BC640	1.20	TT801	1.20	40440	2N3731
7474	.95	74510	1.75	74LS153	.90	BD131	1.50	TT801	1.20	40440	2N3731
7475	1.35	74520	1.75	74LS157	2.40	BD132	1.50	TT801	1.20	40440	2N3731
7476	1.35	74524	1.75	74LS157	2.40	BD133	1.50	TT801	1.20	40440	2N3731
7480	1.50	745112	3.20	74LS163	3.90	BD134	1.50	TT801	1.20	40440	2N3731
7482	2.30	745251	5.30	74LS164	2.90	BD237	1.80	TT801	1.20	40440	2N3731

PC BOARD

FIBREGLASS —	
4" x 3" S.S.	.75
6" x 3" S.S.	1.20
8" x 3" S.S.	1.20
6" x 6" S.S.	1.60
8" x 6" S.S.	2.20
12" x 4" D.S.	2.90
12" x 12" D.S.	6.00
6M CONVERT	2.50
2M CONVERT	2.50

DIP SOCKETS

8 PIN	.45
14 PIN	.45
16 PIN	.45
24 PIN	.98
40 PIN	1.50

TOROIDS, etc.

IRRESPECTIVE OF MIX	
T-12	.70
T-35	.80
T-68	.85
T-80	.85
T-86	1.10
T-94	1.50

Free Date on request.

COIL FORMS

NEOSID772/1	.20
5027/5PL8	.20
7100CN	.20
5020/8PL8	.25
7300CN	.12
F18 or F28	.25

MISCELLANEOUS

30239	1.95
PL259	1.95

(the element and its two discs), and slowly push it into the polythene tube. Ensure that the holes in the tube wall line up with the mounting holes on the coaxial socket such that, when inserted, the radials will all be at right angles to each other (see Fig 2). Push the assembly in until the top of the base plate is 2 mm lower than the bottoms of the four holes in the tube (see Fig 2).

Take one radial. Insert it into one of the holes in the tube, nut end first, and aligned so that the bolt can be inserted into the nut. Very slowly push the radial in, until the bolt can be pushed (with a

screwdriver) through the hole in the radial and into the nut, and tightened. This will take a little trial-and-error, but it is not very difficult. Repeat the procedure with the other three radials. The aerial is now complete, but seal the ends of the radials, and the places where the radials leave the polythene tube, with araldite. This will make the aerial completely rainproof.

A small amount of stray capacitance is introduced by this construction method, however it is less than 14 pF and therefore causes no bad effects. The only effect is that the antenna resonates with a capacitor setting which is somewhat lower

than expected. The beehive capacitor is adjusted by a "tweaker" made from a 2 cm length of rubber tubing, 1 cm of which has been pushed on to a glass rod. To resonate the antenna, connect it to a transmitter via a SWR bridge, and adjust the capacitor for minimum SWR. The Standing Wave Ratio for this antenna is between 1:1.1 and 1:1.05.

To attach the antenna to the mast, run the coax up inside the mast and attach it to the aerial via a UHF-type plug. Then simply push the polythene tube 15 cm down over the mast (see Fig 2), and tighten it on with two hose-clamps. ■

WIDE BAND QUADRATURE RF PHASE-SHIFT NETWORKS

Roger Harrison VK2ZTB
14 Rosebery Street, Balmain 2041

RF phase-shift or phase-splitting networks that have two outputs that maintain a constant phase difference of 90 deg. have quite a variety of uses in communications circuitry and techniques. Probably the most familiar application to amateurs is the RF phase-shift networks in phasing type SSB generators.

I recently became interested in phasing SSB generators and had thoughts of "direct conversion" SSB transmitters. That is, generating SSB directly on the desired output frequency. This technique has some real advantages. The only spurious one has to contend with are the opposite sideband suppression and intermodulation distortion, both of which are considerations in heterodyne systems of SSB generation in any case. Then there's the simplicity of the circuitry. It should be remembered that one of the motivations behind the development of the highly sophisticated complexity of modern IC's is simplification of the external circuitry. What used to require a whole rack of equipment can now fit on one PC board. So, circuit complexity is not to be frowned upon. Circuit complexity is not necessarily synonymous with sophistication or "the state of the art".

REQUIREMENTS

To generate SSB directly on the desired output frequency, and cover a complete amateur band, or a major portion of one, requires an RF phase-shift network that will maintain its characteristics over the required frequency range. Opposite sideband suppression suffers if this condition is not met. A phase error of 2° and/or an amplitude difference of 4 per cent results in a maximum opposite sideband suppression of 35 dB. This figure may be regarded as acceptable in amateur practice. However, if the phase error is about 1° maximum, and the amplitude difference about 2 per cent, the maximum opposite sideband suppression would be 40 dB — a much more acceptable figure.

An RF phase-shift network that covered the 14 MHz band was described by Richard Taylor W1DAX in the September 1969 issue

of QST, used in a direct conversion receiver. The article was subsequently reprinted in the ARRL's "Single Sideband for the Radio Amateur", fifth edition 1970. The circuit described in this particular article is claimed to maintain the 90° phase-shift, and the output amplitudes within 0.8 dB, between 13.8 MHz and 14.8 MHz.

Now, the drawback of this circuit is that it is single band, although it does cover 800 kHz — but when compared to the 14 MHz operating frequency, it isn't exactly "wideband".

Quadrature RF phase-shift networks that operate over an octave or more frequency range have been described many years ago. However, one has to search

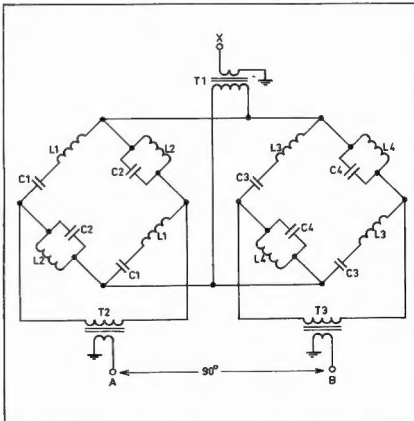


FIG. 1: Circuit of Wideband Quadrature Phase-Shift Network. Maximum Phase Difference Error of about 1 deg., overall Loss from X to Port A or B of about 6 dB. Component Details in Table 1.

the literature on Antennas and Circuit Theory to find them.

The network presented in figure 1 is courtesy of Jim Koehler VE5FP/VK2BOV who designed it from a 1951 paper on circuit theory, for application in a circularly polarised antenna system while he was on sabbatical leave in Australia during 1974-75. Two bridge networks provide 45° phase-shift each over the design range resulting in a differential phase-shift of 90° across that range. The performance of this type of network is excellent. The maximum phase error is about 1°, and the amplitude differences between the outputs is less than 0.5 dB, across the frequency range. The component data for the circuit in figure 1 lists values for the frequency ranges 1 MHz to 15 MHz and 3 MHz to 30 MHz.

This circuit makes direct conversion phasing SSB over the whole HF spectrum possible

Direct conversion SSB receivers covering the same range are also a possibility. "Third Method" SSB generation with the output directly on any desired frequency across the range is also a possibility.

The input and output impedances of each bridge in the network is 200 ohms. The transformers T2 and T3 transform this down to 50 ohms. Although the inputs of each bridge are in parallel, making the input impedance 100 ohms, T1 may be constructed the same as T2 and T3 as the mismatch has no serious effect on the performance of the network. The three trans-

formers are constructed as wideband baluns having a turns ratio of 2:1. Small toroids or dual-hole balun cores such as the Neosid 1050/1/F14 are suitable. The input and output transformers must be physically isolated.

CONSTRUCTION

To construct a suitable transformer using the Neosid dual-hole balun core proceed as follows: Twist together three 180 mm lengths of 26 or 30 B & S enamelled copper wire at about two twists per 10 mm. Wind three turns through the two holes (i.e. around the centre leg) and connect two of the wires in series to make the 200 ohm winding.

If so desired, the secondaries of T2 and T3 may be arranged to drive diode balanced modulators directly.

It is important that coupling between the tuned circuits in each arm of each bridge, and between each bridge in the network, be kept to a minimum. Also, the Q of each coil must be at least 50 or 60 (at the resonating frequencies shown). Consequently, toroids have been suggested although standard coil former and screened can assemblies (with ferrite cup-cores) have been used successfully. Each arm is constructed individually and the inductor adjusted to resonate with the capacitor at the frequency indicated. Each series L-C combination is temporarily connected as a parallel tuned circuit to enable adjustment. This is very simply done with a GDO, using a monitoring receiver to establish the frequency more

precisely. Sufficient accuracy is easily obtained. Alternatively, using a general coverage receiver, each tuned circuit combination may be connected as a parallel-tuned trap in the antenna lead and the circuit tuned for a null at the required frequency. Of course, if you have access to a network analyser or a phase meter, the job is a little simpler.

APPLICATIONS

The circuit of a suggested wideband, passive, phasing type SSB generator/detector is given in figure 2. Transformers T1, 2, 3, 4 are wideband 4:1 transformers as described above. A 7 dB resistive pad/matching network is shown at the input to the RF quadrature phase-shift network. This may be replaced by a transformer like those used for T1-4. The phasing of the secondaries of T3 and T4 is important otherwise the generator/detector will not function. They must be *series-aiding*. The diodes used in the two balanced modulators should, ideally, be matched. Matched quads of hot-carrier diodes would be best. The two 1K pots are to provide balance alignment. The audio phase-shift network must be a passive type if the bi-lateral function is desired. The quadrature output ports of the audio phase-shift network should be low impedance. I have described a suitable circuit in a separate article.

The network described has other applications apart from phasing SSB or Third Method SSB generators/detectors. Antennas consisting of a combination of

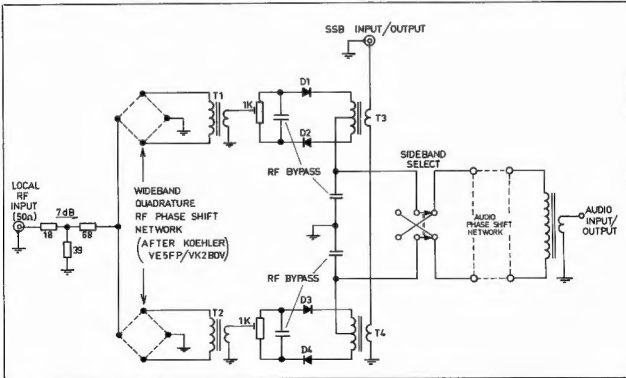


FIG. 2: Suggested Bilateral Wideband Passive Phasing Type SSB Generator/Detector. The 7 dB Pad may be replaced by a Wideband RF Transformer as used for T₁-T₄ (see text).

phased elements driven 90° out of phase (i.e. with ¼-wave phasing lines) could make use of the network. If used for transmitting, suitably dimensioned components would be necessary of course.

TABLE 1

COMPONENTS FOR WIDEBAND RF
QUADRATURE PHASE-SHIFT NETWORK

component	1-15MHz	3-30MHz
L1	1.05 uH	0.465 uH
L2	15.4 uH	6.13 uH
L3	4.36 uH	1.84 uH
L4	64.2 uH	24.2 uH
C1	386 pF	153 pF
C2	26.3 pF	12 pF
C3	1805 pF	604 pF
C4	110 pF	46 pF

NOTES

For the 1-15 MHz network, each L1/C1 and L2/C2 resonate at 7.9 MHz, and each L3/C3 and L4/C4 resonate at 1.9 MHz. For the 3-30 MHz network, each L1/C1

and L2/C2 resonate at 18.8 MHz; and each L3/C3 and L4/C4 resonate at 4.77 MHz.

COIL DETAILS

- 0.465 uH — 4 turns, 26 SWG on NEOSID toroid 12.7 x 6.35 x 3.18/F25, spread out a little.
- 6.13 uH — 14 turns, 30 SWG on NEOSID toroid 6.35 x 3.18 x 3.96/F25 around approx. half circumference.
- 24.2 uH — 34 turns, 30 SWG on NEOSID toroid 12.7 x 6.35 x 3.18/F25 around most of circumference.
- 1.05 uH — 6 turns, 26 SWG on NEOSID toroid 6.35 x 3.18 x 3.96/F25 spread out a little.
- 15.4 uH — 27 turns, 30 SWG on NEOSID toroid 12.7 x 6.35 x 3.18/F25 spread around 2/3 of circumference.
- 4.36 uH — 12 turns, 30 SWG on NEOSID toroid 6.35 x 3.18 x 3.96/F25 spread around half of circumference.

64.2 uH — 24 turns, 30 SWG on NEOSID toroid 12.7 x 6.35 x 3.18/F25 spread around about ½ of circumference

CAPACITORS

- 12 pF — 12 pF, 5 per cent NPO ceramic or silver mica.
- 46 pF — 47 pF, 5 per cent NPO ceramic or silver mica.
- 153 pF — 150 pF, 5 per cent NPO ceramic or silver mica.
- 604 pF — 680 pF, 5 per cent NPO ceramic or 5M in series with 5600 pF, 5 per cent polyfilm capacitor.
- 26.3 pF — 27 pF, 5 per cent NPO ceramic or silver mica.
- 110 pF — 100 pF in parallel with 10 pF, both 5 per cent NPO ceramic or 5M.
- 386 pF — 390 pF, 5 per cent NPO ceramic or 5M.
- 1805 pF — 2700 pF, 5 per cent and 3900 pF, 5 per cent polyfilm capacitors in series.

THE QUEENSLAND AMATEUR RADIO LICENCE STUDY PACKAGE

Information provided by
R. Davis VK4AAAR

Following the success of last year's Novice study package in VK4, several improvements have been made and the study guide extended to include additional material as well as several sets of typical multiple choice exam questions. We thus have a self-contained set of notes for the AOCPP "A" Course. (Persons who intend sitting for the Novice exam are recommended to read one of the Introduction to Amateur Radio type of books such as Understanding Amateur Radio by ARRL or the RSGB — GUIDE TO AMATEUR RADIO by Pat Hawker, in order to supplement the theory with a little general knowledge of Amateur practice. If a student is going straight on to the "B" course then his reading of one of the handbooks will cover this requirement).

THE ADVANCED RADIO COURSE STUDY GUIDE has just been completed and together with one of the AMATEUR RADIO HANDBOOKS — either ARRL or ORR, provides a course of study for the full AOCPP. The "B" course assumes the student has done the "A" course or an equivalent standard. In the study guide there are 5 chapters (i) syllabus, (ii) study guides for ARRL and ORR in 15 sections each with self testing questions, (iii) answers to suit-

able of those questions, (iv) past AOCPP exams, (v) sample answers to past AOCPP exams — 4 past exams (88 pp.).

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Transistorised Phase-Shift Oscilloscope for RTTY

Now you have a FB TU for RTTY you will need some assistance with tuning the signals. A cross display scope or tuning meter of the type used in the ST5 or ST5 is fine for tuning normal RTTY signals. Yet under QRM a phase-shift scope will be preferred to sort out the right mark/space frequencies.

This phase shift monitor scope uses signals direct from the receiver output (or the TU input) and shows a rotating line on the oscilloscope screen. The angle of slope of the line is a measure of the frequency, while the length indicates the amplitude. At a glance, you can determine the frequency-shift on either the receiver or transmitter frequency and you can quickly adjust the signal so that it passes through the TU filters. The frequency difference to interfering signals can also be determined.

THEORY OF OPERATION

The heart of the phase-shift indicator is the simple RLC network shown in Fig. 1. The series LC circuit is in resonance near the centre of the frequency range of interest. Near resonance, the impedance of the LC circuit will be minimum. E_T approaches zero while E_L is large and gives a phase displacement which changes rapidly about the resonant frequency. If two noise waves are supplied to the deflection plates of a cathode ray tube they give a figure which is dependent on the phase and amplitude relationships between these two sine waves. With the two sine waves in phase or 180° out of phase a straight line will be seen on the CRT and the angle of slope of this line will depend on the amplitude of the two signals. With 90° phase difference an ellipse will appear where the eccentricity is dependent on the relative amplitudes of the two signals.

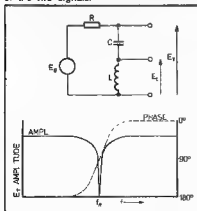


FIG. 1: RLC Phase Shift Network.

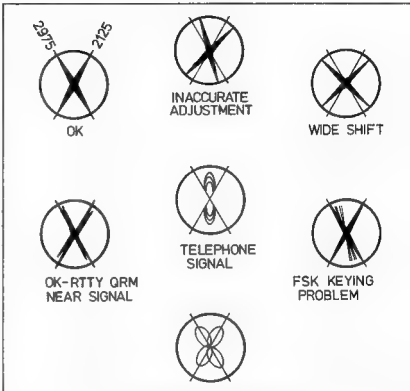


FIG. 2: Phase Shift Oscilloscope Patterns. Lower Figure shows 2 Harmonic Distortions. (Width of Shift is exaggerated.)

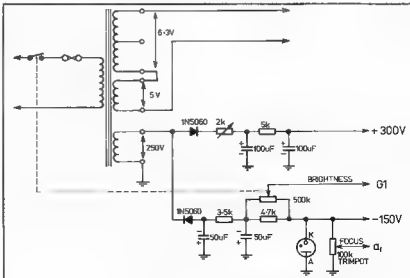


FIG. 5: Power Supply Circuit for Phase Shift Oscilloscope.

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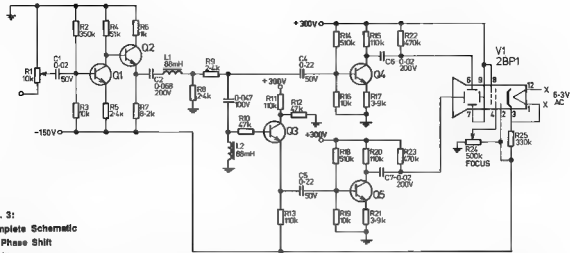


FIG. 3:
Complete Schematic
for Phase Shift
Oscilloscope.

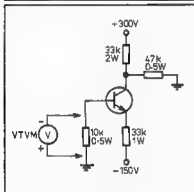


FIG. 4: Testing Circuit for choice of High Gain Transistors.

Measured Voltage	Approx. hFE
—1.5V	30
—1.0V	45
—0.5V	80

If you look at Fig. 1, the resonance circuit is resonant near the centre frequency for the frequency range concerned (2550 Hz). For a circuit with high Q-value the phase angle will range from about 180° to 0° over a small frequency range which gives straight lines on the CRT. In the region of resonance, there will appear an ellipse since the signals are about 90° out of phase, but the width of the ellipse is very small, since the amplitude of the series voltage (ET) approaches zero when the phase angle nears 90° . In this way there will appear a straight line on the CRT for all frequencies concerned and this line will rotate on the screen when the frequency is varied. Typical traces on the phase-shift oscilloscope when receiving RTTY signals are shown in Fig. 2.

CIRCUIT DESCRIPTION

The schematic diagram is shown in Fig. 3.



FIG. 6: Printed Circuit Board Layout.

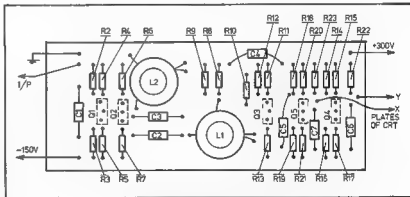


FIG. 7: Circuit Board Component Layout.
NOTE—Transistors mounted on copper side.

Input stage Q1 gives an amplification of about 20 times (about the ratio R4/R5). R2 and R3 are bias resistances for the base. Q2 is an isolating emitter follower which reduces the collector load for Q1 and supplies the current which is required for the LC phase shift network. The series compensation network (C2, L1, R8) you can omit, but it does give two advantages. C2-L1 is in resonance at about 2 kHz and this gives an increased impedance over the 2-3 kHz range which compensates for the increased voltage across the phase

shift coil (L2) with increased frequency, thus maintaining the same voltage at the oscilloscope between 2125 Hz and 2975 Hz. Another advantage with C2-L1 is that signals which are well over or under the 2-3 kHz range have no effect on the CRT and thereby the oscilloscope picture is limited to the desired frequency range.

R9, C3 and L2 form the phase shift network as described in Fig. 1. C3-L2 is resonant at 2550 Hz. Q3 works as an isolating emitter follower to give a high impedance across L2 and maintain a high

Q value for the network. Q4 and Q5 are amplifier stages with an amplification of about 20 times (the proportion between collector loading and emitter resistance). Resistances R14-R16 and R18-R19 provide bias for the transistors.

THE PRACTICAL CONSTRUCTION

I had no suitable new power transformer so I used an old transformer from an outdated radio. This had only a high voltage winding of 250 volt, so I had to construct the supply in a slightly different way than in the initial design. The scheme is shown in Fig 5 and a details should be clear. I found it necessary to put in a brightness control combined with on-off switch.

In relation to CRT's, I looked first for a large screen D9 15-2. This worked well

and gave a very accurate reading of the shift. But the tube was nearly a half metre long and I therefore tried a German surplus tube LB-1 of more suitable size — 6 cm diameter. The case became smaller such that it matched the ST-6 and AK-1 better and I screwed the boxes together in one unit.

The printed circuit is shown in Fig. 6 and component placings in Fig. 7. I had slight difficulties with instability when I used the 10k ohms potentiometer in the input shown in the original circuit in Fig. 3. I changed the potentiometer for one of 100k ohm and with a 22k ohm resistance in series with the sliding contact. The circuit then became completely stable and I had no difficulties after this. Otherwise the circuit seemed completely

non-critical and required no tuning or adjusting.

In respect of its operation, I find it a great help for tuning of RTTY, but I also find that the tuning meter in ST-6 is needed also, especially when tuning 170 Hz signals.

(Reference: "Transistorised Phase-Shift RTTY Scope", RTTY Journal 1/1972) ■
(To be concluded)

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LETTERS TO THE EDITOR

The Editor,
Dear Sir
In September will be travelling from Cairns to Cape York. I proposed to set up a portable station at the tip of the Cape. It will be a Slow Scan Television DX expedition. Bands to be worked are 80 through 10 metres. A special QSL card will be printed for the occasion. The exact dates and times will be announced on the Sunday morning broadcasts in all States.
Stan Mulford VK3BHZ.

The Editor
Dear Sir
Reference Letter published by Mr Rodney Champness VK3JG.
Dear Rodney,
Your articles have not gone unnoticed by the VK5 Division, but my colleagues chose to ignore your unwarranted and unjustified criticism.

In 1842 Samuel Morse, an American inventor the Morse Code. The early method to receive it was on a paper tape which was driven by a hand-wound spring motor. It was difficult for many to receive by buzzer or a sounder early in its history. The invention was one up on the smoke signals, wireless was not invented then.

We later found a use to this very useful in-

vention for wireless communication. It found uses in both World Wars, shipping and other forms of communication. Authorities realised that the standard set down by old Sam Morse was not applicable to its use when sent by hand and received by ear in relation to rigid formation of characters and spacing, so it was used in a form that most amateurs and ship operators adopted according to their needs. The characters were sent faster so as they could be received by sound not by the Dot and Dash principle. So in the year 1959 AD, not so long ago, this was realised, so to paragraph RR ARRL, the amendment clearly states in the ITC 1959 "The spacing between words' should be increased from 5 to 7 dots". This means there is no change in the words per minute to be sent in a given time but each symbol has to be sent fractionally faster to allow for the increased spacing between words (Taken from the RSGB CW Book).

I could not refrain Rodney from replying to your unjust and unwarranted criticisms. I suggest you update your knowledge accordingly.

Jack Tremblay VK5JT,
Co-Ordinator VK5 Div CW Broadcast
M Roberts VK5MY
C Cassie VK5KL
Iain Campbell VK5LI

The Editor,
Dear Sir,
For quite a number of years the January issue of AR had a centre page the front of which gave the conditions and rules for both the DX Century Club Award and the VHF Century Award and the inner double pages gave the Australian DXCC countries list.

Why this has been discontinued is quite a mystery to myself and to many other DX chasers to whom I have spoken. With so little in AR for the DX man, surely the printing of this list of current country identification could be once again furnished.

What the British RSGB and the American Radio Relay League whose subscriptions compare very favourably against those of the WIA, provide a free QSL bureau, the members of the WIA are asked to for each QSL card submitted to the various State bureaux for so many cents.

For the keen contest man and the DX chaser who would in many cases send over 100 QSL's per month, the fee charged almost amounts to another subscription.

Perhaps other readers would give their views on this.
C Whalley VK6KK

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FL-101 SPEECH PROCESSOR: For installation in FL-101. \$79.

FRG-7 WADLEY LOOP RECEIVER: All solid state, 0.5-29.9 MHz in thirty 1MHz bands. Electronic band selection. \$326.

FR-101D RECEIVER: All solid state, 23 bands incl. all amateur bands 160-10m plus 6 and 2m, FM, CW, etc., et. \$639.

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FL-2100B LINEAR AMPLIFIER: 80-10mx, uses 2x572B triodes in G G, twin fan cooled, styled to match FT-101E. \$528.

FT-620B SIX METRE SSB AM, CW, TRANSCEIVER: 10W solid state, AC and DC operation. \$577.

FT-221R TWO METRE TRANSCEIVER: Features all mode operation — SSB/FM/CW/AM — with repeater offset capability, 144-148 MHz coverage using advanced phase-locked loop circuitry AC and DC operation. \$629.

M-620/221/301 MOBILE MOUNT for FT-620B, 221R & 301, \$33.

QTR-24 24 HOUR WORLD CLOCK: At a glance the time anywhere in the world can be read. \$33.

FP-2 AC POWER SUPPLY suitable for use with FT-223, etc. 240V AC in, 12V DC 2A out, built-in speaker and charger. \$85.

FTV-650B SIX METRE TRANSVERTER: Converts 28 MHz SSB to VHF, and includes receiving converter. 50W PEP. Primarily designed for coupling with Yaesu transmitters and transceivers. \$249.

FTV-250 TWO METRE TRANSVERTER: Similar FTV-650B 10W-15W output, but all solid state and built-in AC PS. \$249.

FT-223 TWO METRE TRANSCEIVER: 10W, 23 Channels, plus one priority channel, Inc. 40, 50 & 51, plus one rptr (Other rptrs. available at \$10.00 per ch.) \$225.

YC-500E 500MHz FREQ. COUNTER: Accurate to .02ppm. \$574.

YC-500S 500MHz FREQ. COUNTER: Accurate to 1ppm. \$446.

YC-500J 500MHz FREQ. COUNTER: Accurate to 10ppm. \$319.

YO-100 MONITORSCOPE: Matches the FT-101E, but can be used with other Yaesu equipment. (IF kits 455 kHz and 9 MHz optional extra). \$257. (IF Kits \$19.00 each).

YP-150 DUMMY LOAD/POWER METER: For use over the frequency range 1.8-200 MHz. Three power ranges. 0-6W, 0-30W, 0-150W with built-in cooling fan. \$98.

FF-500X 3-SECTION LOW PASS FILTER for TVI reduction. \$35.00.

F-101 FAN. \$38.

SP-101 MATCHING EXTERNAL SPEAKER for FT-101, FR-101 FRG-7. \$48. SP-120, for 301/221, \$49.

OPTIONAL CRYSTAL FILTERS. (Inc. CW & AM filters for FT-101). \$59.

MATCHING VFOs: FV-101B, FV-200, each. \$139, FV-301 \$149.

YC-601 DIGITAL READOUT ADAPTOR for FT-101E, inc. built-in AC PS. \$230.

YC-221 DIG. READOUT ADAPTOR for FT-221R.

YD-844 DESK MICROPHONE: Yaesu De Luxe PTT Dynamic type with stand, spring and lock PTT switches. PTT also actuated when lifted from deck. \$49.

RS SERIES HF GUTTER MOUNT MOBILE ANTENNAS: RS Base and Mast (doubles as 1/2 wave on 2m). \$22.50. Coil and Tip Rods: RSL-3.5, \$20.00, RSL-7, \$19.00, RSL-14, \$18.00, RSL-21, \$16.50, RSL-27/28, \$16.00.

* Power Supply Price applies only with purchase of matching transceiver

As the sole authorised Yaesu agent and factory representative for Australia, we provide pre-sales checking of sets, after-sales services, spares availability and 90-day warranty.

Quote type and serial number of set when ordering spares. All prices include sales tax. Freight is extra. Prices and specifications subject to change without notice. Allow 50c per \$100 for insurance.



LARGE RANGE OF ACCESSORIES



STANDARD VHF and UHF TRANSCEIVERS

SR-C146A 2m hand held 5 chan. 2W transceiver, inc. carrying case and 3 chns.	\$248.00
SR-C432A, 70cm hand held 6 chan. 2W transceiver, inc. carry ng case and 1 chn (435 MHz)	\$285.00
SR-C430 70cm 12 chan. 10 watt mobile transceiver inc. 1 ch (435 MHz)	\$342.00

STANDARD ACCESSORIES

CMP08 Hand mic for SR-C146A and SR-C432	\$25.00
CAT08 Rubber antenna (helical) for SR-C146A	\$10.00
Heavy Duty Carrying Case for hand held units	\$16.50
AC Adapter and charger for hand held units	\$45.00
Mobile Adapter for hand held units	\$14.50
AC Charger only	\$11.00
N-CAD Penlight Gel s. type AA	\$1.90

MONITOR RECEIVERS

SC101, Automatic scanning receiver, 4 VHF chns., 4 UHF chns. Xtals extra.	\$169.00
MR-2, Min Mon for 12 ch pocket receiver VHF	\$137.94
MS-2, Minv. Scann ng Receiver 4 Ch, inc.	\$186.35

MARINE NOVICE/11 METRE TRANSCEIVERS

GTX-3325 SS/AM 23 Ch. Inc. N.B.	\$299.00
CR-555 AM 23 Ch. Transceiver Inc. N.B.	\$138.00
CBR-9000 6 Ch. In-dash mount. B.C. 2 FM.	\$184.00
606CB 23 Ch. AM/BC/FM MPX/Cassette stereo In-dash mount transceiver	\$388.00
GTX-3335 AM 23 Ch. Transceiver	\$89.00



ANTENNAS AND ANTENNA ACCESSORIES

HF MONOBANDERS

204BA, 4 element 20m Beam	\$254.00
203BA, 3 element 20m Beam	\$214.00
VS-20CL 3 elem W.S. 20m beam, Inc. Balun	\$196.00

HF DUO BAND

VS-22 3 element 15-11/10m, Inc. Balun	\$148.00
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HF TRIBAND BEAMS

TH6DXX, 6-element trap Beam	\$318.00
TH3MK3 3-element trap Beam	\$268.00
TH3Jr 3-e ment trap Beam	\$155.00
HY-QUAD 2 element Quad Beam	\$282.00
VS-33 (Equiv TH3MK3), Inc. Balun	\$227.00

NOVICE BEAMS

CB-3 3-element 11m	\$89.50
CB-5 5-element 11m	\$87.00
Long John 5-element (wide spaced) 11m	\$122.00
Eliminator II, 2-element Quad, Sw'ble polarisation, 11m	\$114.00
Big Gun II, 4-element Quad Sw'ble polarisat on, 11m	\$229.00
SDB-6 Stacked 6-el Beam (3 + 3)	\$163.00

HF VERTICALS

VS41/80KR 10m thru 80m, inc. 11m	\$102.00
VS-RG Radial Kit for VS-41/80 KR	\$29.00
18AVT, 10m thru 80m trap Vertical	\$130.00
12AVQ, 10m thru 20m trap Vertical	\$64.00
18V 10m thru 80m base loaded Vertical	\$49.00
18HT 10m thru 80m Tower	\$346.00
GPGP 1/2 wave, 1m G.P.	\$29.00
CR-1 1/2 wave Ringo, 11m 3.75 dB	\$54.00
HOPE-10GP 10/11 metre helical groundplane	\$81.00
Million V1 11 metre 1/2 wave 3.75dB	\$49.00
VS-10 GH 1/2 wave 10/11 G.P.	\$85.00

HF MOBILE WHIPS AND FITTINGS

AQUA CAT 108' Marine, 11m (no ground plane req'd)	\$88.00
AS27MCE 102' S.S. Whip	\$114.00
HOPE-10R 10/11 metre adjustable gutter mounted helical inc. cable and connector	\$48.00
HOPE-10B 10/11 metre adjustable helical equipped w/ih ball mount and spring	\$44.00
THUNDERSTICK 108' fibreglass whip	\$25.00
SUPER STICK similar to Thunder Stick, but double section	\$26.00
GUTTER CLIP for whip tops	\$2.90
HOPE-15R 15 metre adjustable gutter mounted helical incl co-ax and connector	\$49.00
HOPE-10RE 10/11 metre whip top only (as used in HOPE-10R)	\$28.00
HOPE-15RE 15 metre whip top only (as used in HOPE-15R)	\$32.00
QIT-1H 10/11 metre base loaded, boot or rooftop mount, incl co-ax and plug	\$25.00
CT-2H 10/11 metre centre loaded gutter mounted whip, incl co-ax and plug	\$25.00
AS-303 HF Mobile antenna set, centre loaded, incl heavy duty ball mount and spring	\$136.00
AS-NK matching SS Bumper Mount for AS-303	\$18.00
DUCK 27 MHz Replacement Ant For 11m Walkie Talkies (12" Flex Helical)	\$9.00

FITTINGS: (Suit all makes with 3/8" x 24 thread)

BPR, bumper mount	\$20.00
8DYF, heavy duty adjustable body mount	\$22.00
HWM-1, fixed body mount	\$18.00
SPG, heavy duty spring	\$14.00
SPGM, light duty miniature spring	\$8.00
VS-BM Ball Mount & Medium Duty Spring	\$19.00
VS-BPM Bumper Mount	\$18.00
VS-LBM Ballmount & H.D. Spring	\$22.50



ES FROM BAIL ELECTRONICS



SCALAR HI-MOUNT ANTENNAS



Hugain

MARK MOBILE

HW-80 80m 8ft	\$54.00	HW-15, 15m, 4ft.	\$22.50
HW-80 80m, 6ft	\$32.00	HW-11, 11m, 4ft.	\$22.50
HW-40 40m, 6ft	\$29.50	HW-11, 11m, 6ft	\$23.50
HW-20, 20m, 6ft.	\$24.50	HW-10, 10m, 4ft.	\$22.50

VHF ANTENNAS

23. 3-element 2m Beam	\$22.50
23. 8-element 2m Beam	\$48.00
215B 15-element 2m super-beam	\$84.00
VS-20H 2m 1/4 wave ground-plane	\$32.00
*4B 4-element 6m beam	\$61.00
5B 6-element 6m beam	\$100.00
VS-6GH 6 metre 1/4 wave G.P	\$35.00
ARX-2 three half wave 6dB gamma loop matched vertical	\$49.00
ARX-450 435-450 MHz three half wave 6dB Ringo	\$45.00
AR-6, 6m 1/4 wave Ringo 3.75 dB	\$45.00
A144-7, 7-element 2m Beam	\$32.00
A144-11, 11-element 2m Beam	\$45.00
A144-20T 20-element 2m Twist Beam	\$91.00
A50-3 3-element 6m Beam	\$47.00
A50-5 5-element 6m Beam	\$73.00
A490-11 11-element 430 MHz Beam	\$32.00
GDX-1 80-500 MHz Discone	\$79.00

VHF MOBILE ANTENNAS

270 Doub a stacked 1/4-wave fibreglass whip for 2m	\$56.00
271 Mount for 270	\$8.00
AS-2HR, 1/4-wave SS 2m gutter mount, inc. co-ax	\$45.00
AS-2P4C as above, but fibreglass whip	\$47.00
AS-2HRF 1/4-wave cowl mount type	\$54.00
AS-6RD 6m centre loaded SS whip with gutter mount	\$24.00
VS-07MG 70cm Mag Mount 1/4 wave	\$17.00
AS-2DW 2 metre 1/4 wave gutter mounted whip inc. co-ax and connector	\$29.00
HOPE-2R 2 metre gutter mounted helical, only 22 cms long, incl. co-ax 2 connector	\$40.00
VS-TOWN 2 metre flexible gutter mounted helical	\$19.50
HO-2HR 2 metre Hydaka 1/4 wave gutter mount incl. co-ax and connector	\$44.00

SCALAR MOBILE WHIPS

M-22T 1/4 wave 2m whip top	\$6.50
M-25 1/4 wave 2m whip top	\$16.50
M27-R80T 5ft 11m C.L. whip top	\$21.05
M-40T 4.5 dB Gain, 435 Mhz	\$19.80
M B Standard base	\$4.70
M B UHF base	\$5.80
MAGBASE inc 12ft. of RG-58/AU	\$41.75

ROTATORS

Emulator:	
102LBX Similar to CD-44	\$138.00
501CXX Similar to Ham II	\$207.00
1102MXX Heavy duty	\$299.00
1211 Mast clamp for 102LBX	\$14.50
1213 Mast clamp for 501CXX	\$22.00
300 Mast Stay bearing for above	\$25.00
301 Tower top bearing	\$25.00

ANTENNA ACCESSORIES

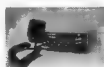
LA-1, Lightning Arrestor for installation in standard 52 or 72 co-axial feedline, designed to Mil specs	\$56.00
LA-2 smaller size co-ax arrestor	\$11.00
BN-66, broad-band ferrite Be us, 2 kW for Beams and Doubles	\$30.00
HN31 Dummy Load Antenna Kit 1 kW oil cooled (or not included)	\$39.00
FF-50DX Low Pass Filter, 3 Section 1 kW	\$35.00
LP-7 TVI Filter low power	\$11.00
KW Electronics L.P. Filter, 5 Section, 1 kW	\$59.90
Porcelain Egg insulators	30 cents
WIDE RANGE of Co-axial cable and connectors in stock	
K-20 70 ohm Twin feeder	36 cents per yd.
Multi-band dipole traps centre insulator	
80-10m bands per pair complete with insulator	\$35.00
Co-axial cable switches 5 position Model 590G	\$37.00
CX-3, 3 position co-ax switch	\$11.00
TWS-120, 2 position co-ax slide switch	\$14.00
TWS-150, 5 position co-ax slide switch	\$25.00
TWS-220, 2 position double pole slide switch	\$25.00
RS-107 Transceiver tester	\$66.00
Inc 1 osc	
Extra Osc for RS-501	\$14.00

SWR AND POWER METERS

† SWFS-2, single meter type, combined SWR and FS meter 50 ohms, inc. FS pick-up wh p, size 5 x 2" x 2 1/4"	
3-150 MHz, UHF connectors	\$22.00
† SWR-2, dual meters, 50 ohms. Simultaneous reading of forward and reflected power.	
5 x 2" x 2 1/4" 3-150 MHz, UHF connectors	\$31.00
SWR-200 large dual meters, switched 50-75 ohms with calibration chart for direct power readings to 2 kW in three ranges. A very elegant instrument.	
7 1/2" x 2 1/4" x 3 1/4"	\$66.00
FS-900A Peak Reading Wattmeter SWR meter 20, 200, 500 and 1000 watts 230 VAC operation 3.5-30 MHz, very accurate	\$73.00
FS-301 Wattmeter/SWR meter 20, 200 and 1000 watts 3.5-30 MHz	\$49.00
† Type numbers may vary	

ANTENNA COUPLERS

HC-75 Tokyo Hy-power labs Trans-match 75w PEP	\$54.00
HC-500 Tokyo Hy-power labs Trans-match 500w PEP	\$112.00
HC-500A Tokyo Hy-power labs inc 160mx 500w PEP	\$119.00
HC-2500 Tokyo Hy-power pep trans. Trans-match 2.5 kw PEP	\$246.00





YAESU AMATEUR EQUIPMENT

Now an addition
to YAESU'S range
of measuring instruments . . .

QTR-24

24 hour
World
Clock



QTR-24

Yaesu has now made an addition to their already well known range of measuring instruments. It is the QTR-24 a 24 hour World Clock. With a glance the time in any time zone can be seen. The clock is coordinated with the position on a 24 hour basis. The QTR-24 is powered by a 1.5V dry cell, which has a normal life of approximately one year. No amateur or SWL station can be complete without one.



Also shown in the photograph is the VO-100 monitor scope. FT-101E transceiver. YC-601 digital readout, adapter and YP-150 dummy load power meter.

OTHER ACCESSORIES

EKM-1A Audio Morse CP Osc with speaker, one transistor and tone control, requires one UM3 cell, in metal case 3 1/2" x 2 1/2" x 1 1/2"	\$14.00
TC-701 Morse Practice Osc. with built-in key and speaker, one transistor and auxiliary earpiece. Copy of Morse code on case. Two can be wired together to form a practice communication set.	\$20.00
MC-701 Mic. Compressor, battery operated. Available with 4 pin mmc connector.	\$56.00
Model 703 Digital Alarm Clock, 230V AC (Copal)	\$26.50

Servicing facilities for all types of Amateur and Novice equipment. We check all sets before sale and provide a 90 day warranty.

All prices incl. S.T. Postage and freight extra. Add ins. 50c per \$100. Prices and specifications subject to change without notice. Availability depends on stock position at time of ordering.



MORSE KEYS

EK-127 Electronic Keyer	\$97.00
EK-150S Single Paddle Electronic Keyer	\$108.00
EK-150D Double paddle electronic keyer	\$108.00
MK-1024 Programmable Keyer, 1024 bit memory	\$203.90
HI-MOUND	
HK-710 De luxe heavy duty morse key. Heavy base. A really beautifully constructed and finished unit. Fitted with a dust cover, standard knob and knob plate. Ball bearing shaft.	\$38.00
HK-808 Similar HK-710 but with full miniature ball race bearings and more precise adjustments.	\$68.00
HK-707 , Similar to above but with dust cover and standard knob. On standard base.	\$19.00
MK-701 Side Swiper key to actuate an Electronic keyer.	\$38.00
BK-100 (BUG) Semi-automatic bug key. Fully adjustable.	\$45.00

VALVES, 572B \$48.00, 6KD6 \$9.50, 6JS6 \$8.50, 6JM5 \$8.00, 52001 (6146B) \$11.50, 12GB7 \$6.50, 7360 \$9.55, 6GK6 \$5.25



**ELECTRONIC
SERVICES**

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JIM BAIL VK3ABA

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Ph. 89 2213

Radio amateur equipment from B.E.S. also sold by:-

Radio Communications Services H. R. PRIDE, 26 Lockwood Cres., 9152	Ph. 88 4329
WILLES TRADING CO., 428 Murray Street Perth 6000	Ph. 21 7858
FARMERS RADIO CITY LTD., 30 Stanley St., Plympton, 5088	Ph. 293 2155
G. T. ELECTRONICS, 131 Waverbury Rd., South Leamington, 7290	Ph. 44 6773
PWRS RADIO, 123 Angelo Street, Hobart 7000	Ph. 34 6912
Aviation Trading, STEPHEN HULL, 184 Robey St., Maccos, 2020	Ph. 857 1830
Amateur & Novice Crown Supplies, W. E. BRODIE, 23 Gileay Street, Seven Hills, 2147	Ph. 571 5445
DIGITRONICS, 185 Perry St., Newcastle West, 2282	Ph. 524 2581
H. C. BARNLOW, 82 Charles St., Adelaide, 5015	Ph. 82 0240
MITCHELL RADIO CO., 69 Ashton Rd., Alton, 4818	Ph. 78 8178
QUICKTRONIC, Jim Black, Shop 11 Alford Cr., Pimp, 2506	Ph. 51 0200
	Ph. 81 2824
	Ph. 70 7164

JAS7677

1977 FEDERAL CONVENTION REPORT

The 1977 Federal Convention was well up to standard in the quantity and quality of work and results. As the Federal President commented in his opening address, it was as well attended as any previous Convention. If not better in fact, tilt in Division delegations and all six members of the Executive.

It is strange that Executive members can influence but have no part in Institute policy making. This is the prerogative of the Federal Council mainly through the medium of the Federal Convention. Now that the Investigator's Report has been considered and implemented to a presently acceptable extent the time has arrived when a number of Constitutional changes will emerge for discussion both at Federal and State levels.

There were three principal general areas for discussion at the Convention. These were "CB", the general field of special and VHF/UHF operations and a number of inter-related miscellaneous items in the novice licensing area. This report should be accepted as dealing only very briefly in the subject matter of note.

BAND PLANS
The Federal Council confirmed the following band plans —

- 0 METRE BAND**
02.000-02.010 EME operation only, any mode
02.010-02.100 DX operation only, subdivided according to mode as follows
02.010-02.050 CW operation only
02.050-02.300 narrow band modes only (p.p. CW, SSB, DSB, AM, FSK)
02.100-02.300 all narrow band modes, DX and local tunable operation
02.300-02.400 beacons only; secondary beacon segment
02.400-02.600 beacons only; primary beacon segment
02.500-03.100 simplex net operation, primarily FM
03.100-04.000 general operation DX, local, and experimental operation, all modes; "private" nets, future linear translators and repeaters

- Calling frequencies are as follows.
02.025 CW
02.050 Meteor Scatter — any narrow band mode
02.075 RTTY (FSK)
02.100 Primary SSB/AM
02.200 Secondary SSB/AM
02.300 SSTV (F4)

- 2 METRE BAND**
144.000-144.010 EME operation only, any mode
144.010-144.100 DX operation only, subdivided according to mode as follows
144.010-144.050 CW operation only
144.050-144.100 narrow band modes only (p.p. CW, SSB, DSB, AM, FSK)
144.100-144.400 all narrow band modes, DX and local tunable operation
144.400-144.500 beacons only; primary beacon segment
144.500-144.600 beacons only; secondary beacon segment
144.600-144.700 general operation; DX, local, and experimental operation, all modes; "private" nets, future linear translators and repeaters
145.7 -146.0 satellite and space communication
146.0 -146.0 FM net operation, simplex and repeater

- Calling frequencies are as follows
144.025 CW calling frequency
144.050 Meteor scatter calling frequency, any narrow band mode
144.075 RTTY (FSK) calling frequency
144.100 primary SSB/AM calling frequency

- 144.200 secondary SSB/AM calling frequency
144.300 SSTV calling frequency

- 70 CENTIMETRE BAND**
The full 70cm band plan as amended is as follows
430-432 ATV Primary Channel DSB or VSB (ATV-1) Video at 426.25 MHz Sound at 431.75 MHz
432-432.01 EME only — any mode
432.01-432.05 DX only — CW portion (with CW calling frequency at 432.025 MHz)
432.05 Meteor Scatter calling frequency
432.05-432.1 DX only — all narrow band modes (including CW) (with RTTY calling frequency at 432.075 MHz and SSB/AM primary calling frequency at 432.1 MHz)
432.1-432.6 Tunable operations both DX and local, all modes (with SSB/AM secondary calling frequency at 432.2 MHz and SSTV calling frequency at 432.3 MHz)
432.6-432.6 Beacons only
432.6-433 NOTE: Calling frequencies should be used solely for monitoring, calling or establishing contacts. Calling frequencies should not be used for net operations.
433-435 FM Repeater Inputs Internationally reserved satellite allocation
435-438 FM Repeater Outputs
440-441 FM Simplex
441-443 Experimental
443-450 ATV Secondary channel VSB only (ATV — 2) Video at 444.25 MHz Sound at 449.75 MHz

- 10 METRE BAND**
An approach is to be made to Central Office for Novice Licensees to be allocated the segment 28.1 to 28.6 MHz (instead of the previous policy of seeking 28.1 to 29.3 MHz). The Executive were also instructed to investigate world-wide 10m band beacon plans. The IARU Region 1 band plan allocates 28.2 to 28.25 MHz as the beacon segment. The existing 10m beacons are located at present between 28.15 and 28.2 MHz.

STANDARDS
Federal Council adopted 7 kHz as the recommended maximum deviation for FM (F3) transmissions in the VHF/UHF amateur bands in respect of repeater and simplex frequencies therein. The Executive are to examine standards for ASCH and other data transmissions

3m REPEATER CHANNELS
The Executive was instructed to investigate the extension of the national FM simplex and repeater band plan to the 147 to 148 MHz segment as a matter of urgency. When general agreement has been reached on the precise channelling, etc., to be adopted a submission will be made to Central Office

GENERAL TECHNICAL
Central Office is to be approached for Novice Licensees to use VFO controlled transmitters in place of the existing crystal (and VFO) control. VFO includes frequency synthesizers. Another motion duplicated an older motion seeking the extension of the 6m amateur band on a non-interference basis down to 50 MHz. Executive is to seek approval for FM TV (F3) transmissions in the 23cm band and upwards on a general or individual basis.

ARNOLD REPORT
Although the Investigator's Report was not adopted an explanatory statement was prepared and issued. This appeared in last month's AR

PUBLICATIONS
Once again Amateur Radio — the joint possession of all Divisions and members — came up for

debate. A proposal that AR address labels should also carry the callign or SWL number of the member was passed. The proposal that monthly lists of new and amended calligns should appear in AR was lost for several reasons. It was agreed that Executive should look into the publication of an 'Amateur Radio Year Book' for use to the general public. Various problems with AR were discussed — such as alleged delays in the mail, incorrect notices and the inclusion of State news of general reader interest. Work on the 1977 Call Book was discussed and a proposal that only postal addresses should be published was lost.

GENERAL
It was agreed to approach the Department for the institution of longer term over cost licences. Proposals for the use of CW by limited licences under certain general conditions were not passed mainly because of the complexity involved. Another old established policy was revived. It was agreed to approach the Department for various more code word endorsements on certificates. Three proposals to amend the RD contest rules failed. It was agreed that the standard procedure adopted in recent years should be followed, namely that all proposals for amendment and new contest rules are to be sent to the Federal Contest (or Awards) Manager who will consult with Executive whenever needed. If the Executive thereafter believes that any particular port or points rates sufficient importance only then will the matter be brought before the Federal Council. Badges, stickers and the like were discussed. The Executive are to continue work on these. The problem of modernising the existing badge (which is also used on certificates and awards) lies in the unavailability of someone suitably qualified to prepare the necessary artwork but it is hoped publicity will result in a volunteer coming forward to help. It was apparent from the discussions that the optimum use of an "internationalism" style logo requires further investigation. A discussion was held about late broadcasts. A review was ordered relating to Amateur advisory committees. A proposal to seek a general extension of the 575 MHz band was dropped in favour of specific applications being made. The same applied to 70cm "in-band" ATV repeaters. Details are to be sought of frequencies in use in shared bands in an effort to discover a way to reduce mutual interference — this applies mainly to UHF and Higher bands. The establishment of a Ron Wideman m. Browne award is to be investigated by the Executive

ORGANISATIONAL
In future, student members are to be billed at the appropriate full normal subscription rate and can pay the concessional rate only on production of a properly completed certificate. The Executive are to revise the EDP green form and membership proposal form. A proposal to standardise personal details on forms was not adopted. It was also decided that it came up during general business and had not been adequately researched. A proposal that interest should be charged on overdue Divisional accounts with Executive was rejected as unilateral

EXECUTIVE AND EXECUTIVE COMMITTEES
The work of the AARTG (relating to RTTY) was agreed to be taken over by the VK2 Div on as it has been relinquished by VKG. The VK2 Division is to be asked to provide a sub-committee of the VHF/UHF Advisory Committee to work on wide band (ATV) and related matters. No other changes were sought in Committee affairs. The Executive appointments for 1977-78 were voted upon and are unchanged except that Mr Roper re-enters as an Executive member in place of Sir Reg. Admiral S. J. Lloyd expiring an Interstate transfer during the year.

DISCUSSIONS
In depth discussions took place on "CB", novice licensing, Novice examinations, Project Australia, the work of VRS, investigator on about a land site in Canberra and feasibility study for its development, IARU and WARC 79 details. Juma WIANEWS in AR reported some of these in detail. Finally,

mention is necessary about financial matters. A budget for 1978 was approved subject to review by August 31. It was so agreed that the Federal element of the 1978 subscriptions (presently \$15) should be reviewed by the same date. The budget, when related to inflationary and other trends, indicated that a small increase could be adequately supported without recourse to the policy that subscriptions be indexed against the CPI. This will be carefully considered by the Finance sub-committee. Much discussion went on about the ITU fund which is used in defraying the costs of WIA representation in ITU conferences, especially WARC 79. Evidence presently available suggests a figure of \$20,000 would be needed for WARC 79 and after much discussion it was agreed that each Division should be levied at \$2.00 per Divisional member payable by 31/3/1978. How each Division is to raise its share of the levy rests with the individual Division. On this basis the largest Division would be required to find about \$2400 and the smallest about \$180. A firm commitment was given by the report of a sub-divisional report has already appeared in AR on the other discussions.

Finally, the Federal Councilors and Divisional delegations at this Convention were

VK1-VK10, assisted by VK1TH
VK2-VK27M assisted by VK2XBZ and VK2ZDD
VK3-VK32K assisted by VK3ACA and VK3JQ
VK4-VK4VP assisted by VK4TE
VK5-VK5QX assisted by VK5P
VK3-VK8NE (with assistance from VK3ASC)
VK7-VK7PF assisted by VK7ZBY

EXECUTIVE REPORT

WIRELESS INSTITUTE OF AUSTRALIA

For the year ended 31st December 1976, the Institute incurred a net surplus of \$8,728.00.

The Executive have taken reasonable steps, before the Statement of Income and Expenditure and Balance Sheet were made out, to ascertain that action had been taken in relation to the writing off of bad debts and making of provision for doubtful debts and to cause all known bad debts to be written off and adequate provision to be made for doubtful debts.

At the date of this report, the Executive are not aware of any circumstances which would render the amount written off for bad debts, or the amount of the provision for doubtful debts, inadequate to any substantial extent.

At the date of this report, the Executive are not aware of any circumstances which would render the values attributed to current assets in the accounts misstated.

At the date of this report no charges exist on the assets of the Institute which has arisen since the end of the financial year and does not secure the liabilities of any other person.

There does not exist any contingent liability which has arisen since the end of the financial year.

No contingent liability or any other liability has become enforceable within the period of twelve months after the end of the financial year which in the opinion of the Executive will or may affect the ability of the Institute to meet its obligations when they fall due.

Since the end of the previous financial year the Executive have not received or become entitled to receive a benefit by reason of a contract made by the Institute or a related corporation with the Executive or with firms of which they are members or with companies in which they have substantial financial interests.

The results of the Institute's operations during the financial year were in the opinion of the Executive not substantially affected by any item, transaction or event of a material or unusual nature. There has not arisen in the interval between the end of the financial year and the date of the report, any item, transaction or event of a material and unusual nature likely, in the opinion of the Executive, to affect substantially the results of the Institute's operations for the next succeeding financial year.

Members of the Executive
(Sgd.) D. A. WARDLAW
(Sgd.) P. A. WOLFENDEN

BALANCE SHEET AS AT 31st DECEMBER, 1976

	1976	1975
Members' Funds:		
Accumulated Fund	\$14,795	\$6,067
Reserve Fund	627	627
Special Funds—ITU	8,653	7,766
IARU	3,989	3,000
	\$17,510	

Represented by:

Current Assets:		
Cash at Bank—General Account	\$9,597	\$1,851
Short Term Deposit	11,038	5,700
ITU Deposit	8,006	8,750
Other Deposits	2,200	—
Sundry Debtors—Less Provision for Bad Debts	13,264	14,840
(2,000)	(2,000)	
Stock on Hand—at Cost	4,068	3,532
	45,099	32,073

Non-Current Assets:

Furniture and Fittings—at Cost	1,672	1,269
Less Provision for Depreciation	—	—
	47,871	33,382

Deduct:

Current Liabilities:		
Sundry Creditors	\$1,053	1,052
Subscriptions in Advance	12,845	12,106
Provision for Superannuation	2,359	1,290
Provision for Project Oscar	600	—
Provision for Holiday and Long Service Leave	3,763	—
Deposits—Magpies	300	300
Darwin Donations	—	1,084
	19,611	15,852
	\$28,060	\$17,510

STATEMENT OF INCOME AND EXPENDITURE FOR YEAR ENDED 30th JUNE, 1976

	1976	1975
Income:		
Members Subscriptions	\$60,005	\$40,485
Surplus—Publications	2,599	2,584
Interest Received	876	900
Leaves Received	—	16,500
	63,580	59,859

Expenditure:

Amateur Radio Deficit (Note 1)		
Audit Fees	\$12,929	15,498
Bank Charges	210	159
Convention Expenses	738	316
Committee Expenses	2,095	1,876
Depreciation	204	259
EDP Expenses	353	322
General Expenses	1,400	2,114
Insurance	654	298
Legal Expenses	691	59
Membership Recruiting	—	254
Provision for Bad Debts	1,404	1,800
Postage and Freight	1,814	1,814
Project Australia	997	1,180
Rent and Rates	2,094	1,787
Repairs and Maintenance	357	283
Superannuation	1,000	750
Stationery and Printing	2,630	1,149
Salaries and Secretarial	12,201	15,371
Telephone	617	459
Travelling Expenses	2,225	146
	54,852	46,467

Net Surplus	8,728	13,452
Accumulated Fund Brought Forward	6,067	(7,385)

Accumulated Fund	\$14,795	\$6,067
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NOTES TO AND FORMING PART OF THE ACCOUNTS

Note 1 AMATEUR RADIO

Income:		
Advertising	\$21,707	\$16,452
Subscriptions	2,105	890
Sundry Income	7,348	1,243
	25,160	18,585

Expenditure:		
Awards	\$90	65
Bad Debts	—	172
Honorariums	3,340	2,725
Postage	6,082	5,428
Printing costs	24,475	24,471
Salaries	3,105	2,305
Travelling and Sundries	1,018	817
	38,091	36,063

Deficit for year	\$12,931	\$15,498
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EXECUTIVE STATEMENT

- (a) The Statement of Income and Expenditure is drawn up so as to give a true and fair view of the surplus of the Institute for the financial year ended 31st December, 1976.
- (b) The Balance Sheet is drawn up so as to give a true and fair view of the state of affairs of the Institute as at the end of the financial year.
- Members of the Executive
(Sgd.) D. A. WARDLAW
(Sgd.) P. A. WOLFENDEN

STATEMENT OF PRINCIPAL ACCOUNTING OFFICER

To the best of my knowledge and belief the accounts for the year ended 31st December, 1976, give a true and fair view of the matters contained in Section 162 of the Companies Act 1961, and required to be dealt with in the accounts as prescribed.

Principal Accounting Officer
(Sgd.) K. V. ROGET

AUDITOR'S REPORT TO THE MEMBERS OF THE WIRELESS INSTITUTE OF AUSTRALIA

1. In our opinion the attached accounts give a true and fair view of the state of affairs of the Institute at 31st December, 1976, and of its surplus for the year ended on that date.
2. As required by the Companies Act 1961 we report as follows in our opinion:
- (a) The attached accounts are properly drawn up.
- (i) So as to give a true and fair view of the matters required by Section 162 to be dealt with in the accounts; and
- (ii) In accordance with provisions of that Act and the regulations, required by the Act to be kept by the Company have been properly kept in accordance with the provisions of that Act.
- Hebard & Bunting Chartered Accountants
Melbourne
15th March 1977
(Sgd.) P. W. HEBARD
Partner

FEDERAL PRESIDENT'S ANNUAL REPORT

1. In presenting this Annual Report of the Executive for the past year, I would like to emphasise that, by means of W.A.N.T.S. printed in AR and the "Federal tapes" broadcast over official WIA stations, a continuous report of Federal and International matters has been put before you all throughout the year.

2. Consequently this report will only make special reference to particular items of importance.

3. The Executive was consisted of myself as President and Chairman, I was also Chairman of Committee 2 of the Australasian Preparatory Group (APG) for WARC 79. Keith Rogot VK3YQ—Honorary Treasurer and Chairman of the Finance Sub-Committee. With this purpose to have Keith in this post, with his wide experience, a WIA financial matters and office management. Peter Wolfenden VK3PA—

Executive Vice-President — continues to hold office as Chairman of the VHF/UHF Advisory Committee and a able to provide the Executive with expert guidance when matters in this area are discussed. Peter is also a member of APG Committee 2. Jim Lloyd VK3DOR has had lengthy experience in WIA affairs particularly in relation to WICEN Ken Seddon VK3ACS — Ken is also Chairman of the Federal Regional Sub-committee and in this area keeps the Executive well informed. Graeme Scott VK3ZR — Graeme is our Education Co-ordinator and has had quite a lot to do this year.

4 I am very happy at the diligent and co-operative way the Executive has operated over the last twelve months.

5 As a regular attendee at Executive meetings was the Chairman of Project Australia, David Hill VK3DOR who provided a great deal of assistance and information in his specialised area. David is also a member of APG Committee 2.

6 The Editor of AR attempts as many Executive meetings as is possible. This is essential as AR is a very important aspect of our activities.

7 During the year we also made use of the specialised knowledge of many individuals who attended meetings of the Executive to provide us with very helpful information.

8 Of course, attending all meetings of Executive is our Secretary/Manager Peter Dodd. Peter has not only proved himself a valuable asset to the Executive but also a very pleasant person.

9 The office is running smoothly and economically keeping the Council and members well informed as to what is transpiring.

10 Attendances. The following is a statement of attendances at Executive meetings since the last Convention —

Total number of meetings:		14
Name	Dr D. A. Wardlaw	Attended 14
	Mr P. A. Wolfenden	13
	Surg R/Adm S. J. Lloyd	13
	Mr. K. V. Rogge	13
	Mr K. C. Seddon	13
	Mr G. F. Scott	13
	Mr D. J. B. Hull	13
	Mr. B. Bethols	13
	Mr. W. E. J. Roper	6

10 Other Federal officers were: Introduced: Water Co-ordinator A/R, Chandler VK3LC Historical Officer Max Hull VK3ZS Federal Contest Manager, Kev. Ph II ps VK3AUQ Federal OSs Manager Ray Jones VK3JR Federal Awards Manager Brian Austin VK3CA Chairman of the APG, Alan Vignall VK3VW Federal WICEN Co-ordinator Rex Rosabale VK3QJ. They all deserve our thanks for jobs well done.

DEPARTMENT OF POSTS & TELECOMMUNICATIONS

11 Throughout the year we have had regular meetings with the Department of Posts and Telecommunications Radio Frequency Management Division.

12 These personal meetings have made it much easier to conduct our business with the "RFMD".

13 I am continuing as Chairman of Committee 2 APG (Australian Proprietary Group) WARC 79.

14 Numerous matters of concern to all amateurs have been taken up with the P&T Department. The results of these negotiations have been well documented through the columns of WIANEWS.

INTERSTATE VISITS TO THE MEMBERSHIP

15 During August I had the opportunity of visiting the Queensland Division making sure I had a chance to meet as many of the members of the Division as possible.

16 My first stop was Brisbane where I attended a Divisional Council Meeting. On the next evening there was a well attended general meeting of the Division. At this meeting I was able to bring the members up to date on many matters of Federal importance, answering questions and obtaining the views of the membership on a wide range of subjects.

17 My next stop was Rockhampton where I attended the Central Queensland Convention. This gave me further opportunities to speak to many country members from surrounding districts.

18 From Rockhampton I flew to Mackay where I had lunch with a number of members for further discussion. I then flew to Townsville where, at a meeting of the Townsville Amateur Radio Club,

I was able to have wide ranging discussions with the members on a variety of subjects.

19 This trip, which took me more than 2500 km from Melbourne, enabled me to gain first hand insight into the needs of country members in the more distant centres of Australia and also to give them in return first hand information as to what was happening on the Federal front.

20 On passing through Sydney on my way to Queensland I promised the President of the NSW Division that I would pay them a visit in the near future. The latest time of travel used to be the weekend — the Gosford Convention.

21 On Friday, 12th February, I attended a general meeting of the VK2 Division and then all day Saturday was spent at the Wireless Institute Centre to meet the Council and specialised groups. This allowed extensive discussions of Federal matters to be conducted as well as divisional policies to be explained.

22 On Sunday I was driven to Gosford for the Convention where the record attendance of almost 700 gave me the ideal opportunity to meet many members from all over the State.

23 On the last weekend in March I visited Adelaide for the opening of the South Australian Divisional H.Q. at Thorburn. This visit gave me the opportunity to discuss Federal matters with the Divisional Council. It was attended opening ceremony enabled me to meet many of the members.

24 This Division must be congratulated on the fine job they have done in preparing their H.Q.

25 Another visit of importance was to Canberra where the Honorary Treasurer, Keith Rogge VK3YQ and myself were invited to investigate at first hand the site for a possible future national H.Q. for the WIA and discuss the feasibility plans as prepared to that date.

POSSIBLE H.Q. BUILDING IN CANBERRA

26 The NGOC is presently making lease sites available for use as the H.Q. of National organisations. All of these sites are in one area set aside for this specific purpose.

27 On hearing about this the AGT Division made the appropriate inquiries as to the conditions of occupancy that would be required. A site is available and a financial feasibility study was based on the use of this site. Certain conditions were set down for the design and use of the building. In order to allow the various organisations to recoup some of their expenses in building their H.Q. in Canberra, 50% may be leased to tenants while the remaining 50% is to be used by the organisation for its own purposes.

28 The sums of money involved are large and it is generally felt that a project of this nature must not be a burden on the running costs of the Institute and that if we are to proceed more information is needed.

29 Of course it must be borne in mind that at this stage there is no intent of moving the H.Q. of the WIA to Canberra as the H.Q. of the P&T Department is still remaining in Melbourne.

30 Thus the proposal must be looked at entirely as a business one. With this in mind, therefore, I commend members to give it their careful consideration.

RECRUITING

31 As Noel Eaton VE3CJ, the President of IARU has said, the best way the majority of amateurs can help in the preparation for WARC 79 is to belong to their National Society.

32 The WIA, with this in mind, has launched a recruiting drive with advertisements in EA, and ETI. We also printed pamphlets one of which was aimed at the non-amateur explaining amateur radio and the other aimed at non-member amateurs. Of course the main burden of recruiting must fall on the Divisions. It is pleasing to see so many members joining.

NOVICE LICENCES

33 At the last Convention it was decided that Novices were to be full members and to this end the Divisions are busy having their Constitutions altered.

34 The P&T Department has announced that Novices will be granted a 200 kHz segment on the 28 MHz band, a condition the WIA has been seeking ever since the introduction of the licence.

REGULATION

35 The following postal motion dated 13/8/76 was passed:

"That having regard to practical considerations and the necessity for the re-organisation of WIA educational arrangements it is resolved that Motion 72/201 be rescinded and that no other similar constitution be recognised but that the Institute apportion to tender every possible help and assistance for the training of youth heretofore with the object of preparing them for the Amateur examination, including the continuing provision of Certificate forms, publications and the like."

The NSW Division suggested that all Divisions should report at the next Convention how things were proceeding without a Federal VRCS Co-ordinator.

36 The WIA Federal Education Co-ordinator has met with the RFMD Examiner and had useful discussions. Sample examination questions were provided.

37 In collaboration with experts from several Divisions a novice examination syllabus has been produced.

38 Interstate co-operation has also occurred in the running of trial novice examinations. These examinations give the potential novices the means to determine whether they have reached the requisite standard to enter the training course to see if the percentage of passes increases.

WARC 79

39 It was not until the 1976 Administrative Council meeting of the ITU that an agenda for WARC GENERAL 1979 was produced.

40 It has now become apparent that a significant number of countries are not satisfied with this agenda. Many say there is insufficient time and want it extended, others say it may be best split into two separate sessions.

41 The Australian Administration feels that providing the facilities can be made available the conference could be completed in ten weeks. It would, however, be a very intense conference. This uncertainty creates problems for amateur representatives both national and IARU.

42 During the year, by courtesy of the IARU, a considerable amount of material has been made available to Societies.

43 Michael Owen VK3KJ, was invited by Noel Eaton VE3CJ President of IARU to attend the International Working Group in Geneva which produced the IARU model brief for use by member societies.

44 The WIA consolidated a vast amount of material into a background information paper.

45 APG Committee 2 (the Amateur and Amateur Satellite Services Committee) was charged with the identification of areas of band change and band retention and the production of a scenario to the year 2000.

46 This material was presented to the 4th APG meeting as was the material from all other Areas. There are areas of overlap and at this stage only very preliminary discussions have taken place.

47 During the next six months a great deal more will be heard on these matters.

REPEATERS

48 Repeater co-ordinator as it all being carried out from Melbourne with a member of Executive as Chairman.

49 There have been two main areas of concern to the Committee. Firstly, the repeater licence conditions that have been proposed by the P&T Dept — to delete the matter has not been finalised. Secondly, the need for additional channels over and above those provided for in the current band plan — the problem is particularly acute in NSW.

50 The point has been repeatedly made that the WIA has formulated a band plan for repeaters not only on 2 metres but also on 70 cm. When the P&T Dept is approved by the responsible authority to set up a repeater the WIA should be informed in order that all repeaters will conform with orderly band planning.

THE MAGAZINE

51 Over the past year it was pleasing to see that the Publications Committee has been able to maintain the high standard of AR.

We are fortunate in having a printer whose efficiency has enabled the printing costs to be contained at a very reasonable level.

53. Again the advertising revenue has helped to keep the cost to members down, although distribution costs (post and mailing service) have risen.

54. In December 51, Roper VK3ARZ found it necessary to resign as Editor and Bruce Stathos has taken over. It has always been a tower of strength to the WIA particularly during his 4 1/2 years as Editor, a job he took when the magazine became Federal.

CALL BOOK

55. Agreement has been reached with the P&T Dept. as to the conditions of a contract for the production of the Call Book for the next 10 years.

56. It will be produced from a computer print-out. Of course the accuracy will only be as accurate as the material supplied as far as non-members are concerned.

MAGPUS

57. Magpus continues to provide members with a service. Technical publications are available at very advantageous prices. This service is in no way subsidised by the membership dues and in fact supplies a small profit when all expenses are brought into consideration.

THE ARNOLD REPORT

58. At this stage I would appear that the investigator's report by Bob Arnold has made little if any impact. The feedback from members so far as can be gauged here has been negligible.

59. The financial problems of the Executive during 1978 probably had much to do with the reorganisational concept. This was now fallen through by reason of the magnificent response by Divisions to the Federal levy mutually agreed and paid in 1978?

60. Since the Federal Council supports the Executive very strongly it must be assumed that no overriding considerations, other than financial, are operating to cause a reorganisation to occur for purely Federal reasons. The general climate surrounding Federal activities appears to have undergone considerable changes in the light of public service activities being brought into being during the past year or so.

WICEN

61. Our Federal, WICEN Co-ordinator, Brig. Rex Tomlinson, attended a Communications Seminar at the Civil Defence School at Mt. Macedon during the year.

62. HF WICEN net primary channels have been agreed on.

63. It was also felt that there is a need for greater flexibility when emergency arises and third party traffic is required to be handled. The matter has been raised with the P&T Dept.

PROJECT AUSTRALIA

64. David Hull represented the WIA at the Oscar 47 and 60 Operations meeting held in Washington D.C. during May 1978. A report of this meeting was published in AR in August 1978.

65. David has been in attendance at many Executive meetings and keeps the Executive well informed on Amateur Satellite Service matters.

INTRUDER WATCH

66. A.T. Chandor VK5LO, continues his dedicated work as Intruder Watch Co-ordinator, editing a regular column in AR.

67. This is a very important facet in our preparation for WARC as it indicates that we are well aware of the situation on our frequencies.

JARL 50th ANNIVERSARY

68. The Japan Amateur Radio League celebrated its 50th Anniversary from the 23rd to the 26th September, 1978.

69. Michael Owen VK5KJ the Immediate Past President was able to represent the WIA as he was visiting Tokyo on his way back from the IARU Working Group in Geneva.

70. An opal rock shaped like a map of Australia was presented to the JARL by the WIA.

NZART 50th ANNIVERSARY

71. The WIA was invited to send a representative to the NZART Golden Jubilee Conference during the year.

72. Keith Rogett, the Federal Treasurer, was able to represent the WIA and convey our congratulations to our sister Society across the Tasman.

DARWIN FUND

73. After consultation the Darwin Club had it unanimously agreed that monies collected in the Darwin Appeal fund should go to the club and not to individual members. Accordingly, a cheque for the full amount collected, \$1084.30, was sent to the President of the Darwin Club with the request that the money should be used to acquire tangible assets for the club.

UMF WORLD RECORD

74. Our congratulations go to VK5WG in Albany and VK3OR in Enfield, a suburb of Adelaide, who on the 25th January 1977, broke the world distance record for 1296 MHz.

"CB"

75. During this year the pressure on the Government to introduce a CB type service has reached an extremely high level, particularly with the unrestricted importation of cheap 27 MHz transceivers.

76. It is now obvious that a majority of those who wish for the introduction of a "CB" service into Australia will only be satisfied with one in which 27 MHz frequencies will be available.

77. This covers an allocated amateur band and it is clear that both amateurs and "CB" cannot share the same frequency.

78. It is also clear that "CB" as advocated by the majority could in no way be made to fit into the ITU definition of the Amateur Service.

79. Letters to the Minister have pointed out that the 27 MHz band is an important one for the Novice Amateur operator. It has also been pointed out that Australian amateurs have already been disadvantaged as far as the Region 3 allocations are concerned in that we do not have the full extent of the 5.5 MHz band and, furthermore, we have been deprived of the lower half of the 80-84 MHz Region 3 allocations. We must, however, admit that some small compensation was given in the past by extending the 7 MHz band by a mere 50 kHz.

SUPERANNUATION FUND

80. The Treasurer will report on the progress made in the setting up of a Superannuation Fund for WIA staff.

MEMBERSHIP STATISTICS

81. These are compiled, with adjustments, from the EDP data at mid-December 1978 input and P&T Department data as at 31.12.78 as supplied by telephone.

TABLE 1 (Previous year in brackets) Totals:

	Total Licences	WIA Licensed members	% members to total licences	Other WIA members	Total WIA members
VK1	144 (128)	79 (83)	55 (64)	31 (33)	110 (116)
VK2/BN	2383 (2233)	978 (967)	41 (43)	267 (232)	1245 (1198)
VK3	2219 (2144)	1067 (1074)	48 (50)	324 (345)	1411 (1419)
VK4	861 (815)	503 (457)	58 (56)	154 (155)	657 (612)
VK5/8	807 (836)	406 (473)	50 (57)	180 (181)	676 (694)
VK6/9X	181 (521)	266 (278)	80 (53)	80 (98)	366 (347)
VK7	246 (238)	154 (160)	63 (67)	67 (64)	221 (224)
VK0	6 (8)	—	—	—	—
	7336 (6919)	3588 (3482)	49 (50)	1163 (1081)	4891 (4573)

*Includes 16 "Junior Associates" (3 with call signs)

TABLE 2. P&T Dept. Licences Distribution:

	Full Call	Limited	Novice	Total
VK1	114	87	3	144
VK2	1653	863	65	2381
VK3	1378	790	53	2219
VK4	553	285	13	851
VK5	648	269	26	943
VK6	414	139	25	578
VK7	164	80	2	246
VK8	40	16	8	64
VK9*	—	—	—	5
VK0*	—	—	—	5
	4852	2257	157	7336

*2 on Norfolk Is., 3 on Christmas Is.

TABLE 3. WIA member clubs and groups

	Licensed	No licence	Total
VK1	2	—	2
VK2	11	4	15
VK3	17	2	19
VK4	13	1	14
VK5	8	1	9
VK6	7	2	9
VK7	—	10	10
	55	10	65

TABLE 4. Students, Pensioners and other concessionary grades

	Students Lic.	N.L.	Pensioners Lic.	N.L.	Life Memb.	"Family" Memb.
VK1	1	—	—	—	1	—
VK2	19	19	64	8	10	1
VK3	60	64	44	10	5	12
VK4	3	—	31	7	3	5
VK5	1	9	19	8	6	9
VK6	5	6	11	3	5	—
VK7	—	8	4	2	5	1
Federal	—	—	—	—	11	—
	99	105	173	38	46	25
	194	212	212	55	46*	27

NL = Not Licensed.

*2 are without call signs — i.e. 10% of membership

A. Membership Grade

F	2465
A	773
C	636
T	222
S	194
H	1 Error — should be E.
L	46
B	52 Direct subs. (\$10.80)
D	85 Direct through agency (\$7.20)
E	85 NZART (\$7.20)
G	284
J	87 Free copies—reciprocal & IARJ etc
	4962

B. Destination outside Australia

New Zealand	89	Thailand	2
Papua New Guinea	21	Sri Lanka	3
USA	41	Pakistan	2
UK	14	New Hebrides	2
Japan	10	India	2
Malaysia	5	Canada	3
Switzerland	6	W Germany	3
Indonesia	3	Mexico	2
Philippines	4	Christmas Is.	2
Singapore	3	Hong Kong	4
and one each to			
Danmark, Sweden, Norway, Finland, USSR, Turkey, Netherlands, Libya, Botswana, S. Africa, Burma, Rhodesia, W. Samoa, Mauritius, S. Korea, Oceania, I.R.			

(Sgd.) DAVID WARDLAW President

VHF-UHF AN EXPANDING WORLD

Eric Jamieson, VK5LP

Perth, WA 6150

AMATEUR RADIO REACTORS

VK3	VK0MA, Dawson	62.760
VK1	VK1RTA, Canberra	144.478
VK2	VK2VI, Sydney	52.668
	VK2VI, Sydney	144.478
VK3	VK3RI, Mittagong	144.120
VK3	VK3RTD, Vermont	144.700
VK4	VK4RTI, Townsville	62.800
	VK4RTT, Mt. Mowbray	144.080
	VK4RUB, Brisbane	425.400
VK8	VK8VF, Mt. Luffy	53.500
	VK8VF, Mt. Luffy	144.300
VK8	VK8RTU, Perth	52.300
	VK8RTU, Geelong	53.350
	VK8RTW, Albany	52.300
	VK8RTW, Albany	144.080
	VK8RTV, Perth	145.900
VK7	VK7RMT, Leeton	52.400
	VK7RMT, Leeton	144.900
	VK7RTW, Leeton	425.475
VK8	VK8VF, Darwin	62.200
JA	J1Y1AA, Japan	60.110
HL	HL3WJ, South Korea	60.110
K8B	K8BJX, Guam	60.110
RN8	RN8BHI, Hawaii	56.104
ZL	ZL1VHF, Auckland	144.180
ZL3	ZL3MHF, Upper Hutt	20.170
	ZL3VHF, Palmerston North	52.500
	ZL3VHF, Wellington	145.200
	ZL3VHF, Palmerston North	145.260
	ZL3VHF, Palmerston North	451.850
	ZL3VHF, Christchurch	145.300
ZL3	ZL3VHF, Dunedin	145.400

News has finally filtered through that the 303AA beacon in Fiji is not operating, as has been removed from listing. An additional beacon in New South Wales is VK2RNR, which is located at the QTH of Barry Goodman, VK2ZAG at High Range near Mittagong, operating on a frequency of 144.725 MHz, running on a 5 metre vertically slanted beam, using a 200W transmitter. The antenna is a wire collinear, and identifies every three minutes on MCW. The purpose of the beacon is to evaluate High Range as a possible permanent repeater or beacon site. Reports covering a period of one week are required and may be forwarded to Barry at P.O. Box 318, Mittagong, NSW 2575. The above information came from Jan Japes VK2EYV the VK2 VHF and TV Group Secretary. The information should have been included last month, but was missed, sorry Jeff.

6 METRES

Geoff VK3AMK with some news, saying he had a 14 MHz QSO on 30/4 with 302AZ in Fiji and mentioned 6 metres to him. He replied there was no current activity on 6 metres there, the last brief contact he knew of was with ZL1GI over two years ago. 302AZ said he heard the VK2 beacon but after trying to raise VK4 on HF could not find anyone interested in 6 metres! He will still try if anyone is interested. Their 6 metre allocation is 50 to 54 MHz, but operation is unpopular due to a number of local people listening Australian and New Zealand Ch. 0 and Ch. 1 TV, as there is no local service. Geoff would you do you get anywhere with that sort of set-up?

Geoff says "The way 6 metres has been over recent years, and especially the last few months, anyone in a location such as 302 who has not been working DX has not been trying! Recently I have spoken to ZL3QK and ZL4MB on HF and both complained what a poor season it had been. Again, I can't really understand this at all. Last 23/10 I put my 6 element yagi at 18 feet and pointed to Tokyo, two hours later the band opened into JA with 5 x 9 signals and did the same again on 4/11. During the summer I left the antenna in the same position, mounted vertically and worked vertically to P28 and ZL using 50 watts. The vertical is fantastic in reducing noise from Ch. 0 and I spent most of the time listening. It was such a change to be able to hear backscatter that

normally would have been lost in Ch. 0 noise. As far as I can tell the vertical made no difference to any DX signals, and the lack of QRM from Ch. 0 put me way in front of other seasons even without the facility of being able to turn the beam. The only problem seems to be weak signals from beyond about 30 miles with stations with horizontal polarization. This I had expected anyway.

"During the autumn I have religiously monitored 50 to 52.1 daily from 0315 to 0445 Z but not a trace of Jas. Most of the VKs and the VKs were hearing and working JAs around Easter there was nothing here. Previous JA openings to here have been extremely selective, one side of Melbourne enjoying 89 signals while inaudible across town."

Thanks, Geoff, for another one of your newsy letters - your comments are interesting with regard to vertical polarization and Ch. 0. Equally interesting is your support for my argument of long standing that there were more people to watch 6 metres and transmit as well as listen there would be many more contacts made, and I still maintain the equinoxial periods will be the times when trans-equatorial or trans-circum-DX will be the best. There are some more letters to follow now which lead further support for my previous many proddings for you all to operate then.

Albert VK2ZFB has penned some comments to one of my recent opening comments in this column re "lack of activity following the usual finish of the Ross Null Contest". He supports the view that the six metre band in particular is hardly ever closed down, it's only the operations. To support this view he reports that on 8/4 he came across three VKs having a ragchew, which he promptly broke up. On 11/4 he worked three VKs, on 17/4 heard VK2BMO working some JAs on CW and phone, so called and worked JHBKX at 0340 Z. His first JA in 1974 year. On 26/4 it was ZL3AA at 0720 Z. Albert asks how long it will be before some fellows wake up to the possibilities of such contacts at periods other than the usual Es summer period. I heartily concur with you Albert ... SLP.

Ross VK4RO has sent a letter to me and a tape and details from both follow. Firstly I think congratulations are in order for his contact with KH6GRU in Hawaii on six metres. The details of reports of 5 x 9 were exchanged both ways, and this is most likely to be the first such KH6 to VK contact since the 1957/58 period. Clive VK4ZKE who was only using a dipole antenna also had a contact with KH6GRU and Mario VK4MS was heard calling CO in the 'a's.

The tape originally came from Bert KH6GRU who stated during the contact with Ross VK4RO that his signals were available for an hour before he had to QRT. Signals were 5 x 9 most of the time, with some slow fading. Bert advised first hearing strong signals from VK stations on 10 metres, so he programmed the beacon station station 10 (15 miles away) and heard better. Ross VK4RO heard 50.104. The contact between the two stations was on 52.1 MHz, and quite a lot conducted via CW because Bert was having some trouble with his 6 metre lines.

Bert mentioned he had been heard on 8/4 in Guam, on 8/4 in Guam and Japan, and 16/4 in Guam. Ross VK4RO had been heard on 8/4 in Hawaii during the contact with KH6GRU. On 23/4 he worked 4 or 5 stations between 1300 and 1900 Z. He listens for Ch. 0 in Australia on 51.750 and Ch. 1 in New Zealand on 50.750 but so far nothing heard. Bert first came to Hawaii in 1968/9 and worked South America regularly around 2300 to 0100 Z during the autumn. He will be looking for Ross and any other VKs during September/October this year.

The KH6QEI beacon is on 24 hours a day and uses Heathkit SB110 equipment running 80 watts output to a 5 element beam. The antenna is programmed to three different directions during the day, from 1800 to 0400 to USA on a bearing of 50 degrees, 0400 to 0645 to Guam and 0645 to 1800 to ZL or F08 about south. KH6GRU runs F08/400/FLX010 to Collins 2251 for six and two metres, with home brew line running 500 watts. The only time he has previously been heard in Australia was during 1969/70 and that was probably by VK8KK, but no contact made.

In his letter Ross VK4RO gives details of most of the northern VK4 openings during March and

April, all reported JA openings were the afternoon type, no fast QSB (Rutter) like evening type. Most stations heard were SS8 or CW, very few AM from the north now. Whilst it might seem we are hammering six metre equinoxial activity at the moment, (well, that's deliberate, because I want more of you guys who are home and have the equipment and opportunities to turn around to do so) the more contacts we can make I like the Hawaiian contact, then the more likely we are to get the big guns from the USA to take an interest in our portion of the 50 to 54 MHz segment. So if the following outline of VK4 activity does not start to whet your appetite, then I am sure nothing will.

- 19/3 First JA opening, 0540, short, with QSB
- 20/3 JA 0600, long opening to SA
- 26/3 JA 0550, short, QSB
- 27/3 KH6QEI 0240 to 0340, peaking 59 + JA, 0330, short, QSB. P28GR 0345 5 x 3. VK1, VK2, 0900, weak.
- 30/3 KH6QEI, 0300, 530.
- 8/4 JA 0440 long, to 59 JA 0630, short, to 59
- 10/4 JA 0530 short, QSB.
- 11/4 VK*, 2 and 5 0330 to 0600, QSB.
- JA 0900 short, QSB JA 1030 long, QSB, moderate strength.
- 15/4 JA 0900 short, QSB.
- 16/4 VK2 and 3 0030, short, QSB.
- KH6QEI 0410 519 to 516, short.
- P28 0440 QSB. JA 0530 long, QSB. VK6VF 0652 530.
- 17/4, KH6QEI 0530 599.
- KH6GRU 0630 5 x 9. Contact with VK4RO VK2 0622 5 x 9. Ch. 0A 0630 weak.
- P28 0650 QSB. KH6QEI 0652 519 (back in again) JA 0940 weak.
- 18/4 KH6QEI 0300 599. VK4RO reported heard in K06 at 0300, 529.
- 30/4 JA 0830 - 1000 long, 8 +.
- 21/4 JA 0745 - 0800 long, 89.
- 22/4 VK 0553 5 x 9.
- 23/4 JA 0730 weak.
- 24/4 VK8 0400 5 x 9.
- 26/4 P28 0720 5 x 9. JA 0630 short, 5 x 3.
- 27/4 JA 0900 short, 5 x 3.

No more openings after 1/4 data. Stations working JAs were VK4JA, VK4RO, Clive VK4ZKE, George VK4GS, Joe VK4JH and Mario VK4MS.

That's it, chaps: that list shows the measure of activity in the good areas to the north of our big country. In fact I did copy a tape brought to me by David VK8KK from a VK3 who had been amongst the DX twice, but my copy did not turn out very well so cannot at this stage pass on the information it contained. Too late for a recap for this issue.

However, as a result of this and previous jottings on the same subject, it looks as though we will all need to be more on the ball in future so we can participate in some of the good as offering!

Being rather tied up at night at the moment I cannot offer you anything in the way of news on the two metre scene, but will try and show some improvement in that direction for the next issue.

INTERESTING REPLY

On the EME contact between VK2AMW and a station on the African continent took place on 23/4/77 when we were able to contact ZESJ on our first attempt since his raw 32 foot diameter dish has been operational. His signals were a mix of 7 dB over noise, making copy quite easy whilst a 5 dB signal was heard on the moon. His remote receipt of down pointing is still giving trouble as he has a second operator continuously steering it. Fortunately he had clear skies. It was heavily overcast and raining part of the time at our end, needing total reliance on calculated position of the moon and on remote remarks.

This was the first known UHF contact between Australia and Africa. It also means that VK2AMW has now had confirmed contacts with stations on all continents outside Australia on 70 cm. This took approx 7 1/2 years of EME work.

Tests were also carried out on 30/4 with VK4VW, who was heard for 10 minutes but not strong enough for contact to be made, also with W02ZL and W7GB1, neither of whom were heard. Our echoes were quite good, at 0 dB max, over noise, on this occasion.

'It was good to have Club members present on both of the above dates, in addition to the operators, VK2ALU and VK2ZEN.

"Information has now been received from Austin Youngman of 4RM on the dispute excited amongst the Clavin type lead. This confirms that the present lead on our dish could be suitable for modification. It should give better illumination efficiency, hence a little higher dish gain than our existing system. VK3ALU" From The Propagator

From Graham VK8ZGJ comes a letter outlining activity in Darwin recently, and he reports considerable activity on six metres, with JA openings on March 13, 26 and 31, April 1, 2, 10, 18, 19, 20, 26, 27, May 1 and 2. It is interesting to note that a number of the openings have been later in the day than those noted by Ross VK4RO. Graham lists some as late as 1100 to 1336 Z, with the evening openings. Also signals were heard on the 50 MHz end of the band on April 21, 23 and May 5 and 13.

Graham reports the most reliable indicator of band openings as being the Russian/Chinese TV video on 49.750. The 49.303 FM is also OK but not so good in the evenings. No JA amateur beacon have been heard so far this year. He has worked on JAT, 2, 5, 4, 6 and 9 and JRM in just over 100 contacts.

In talking to the JAs Graham has received word they have been hearing the KH8EGI beacon regularly but no contacts made (source JA1LZK). From comments received all States in VK except VK6 have been working JA stations, particularly good on 8, 10 and 1100 April. PQ8QR was worked in Japan on 23/4, with the QRM Guam is a regular contact there.

On 17/5 Graham reported a brief opening to JA 0557 to 0920. Many signals on the 50 MHz and working KG6, but only two on our part of the band. Signals were over 92 JAT175 reported he worked KLTHAM (Alaska) on 15/7/77.

Graham further reports the VL5BA beacon on 48.6 MHz is back on the air, but no further details of equipment or location. There is some talk in the Darwin Radio Club that the 2 metre beacon will be on the air shortly. VK6VV has agreed to get it going. "That's good news for everyone, even down south of the continent. Thanks for the letter Graham, we feel rather envious of the six metre activity up there."

I compliment the Gold Coast Radio Club for their new improved monthly newsletter, and hope it will be instrumental in increasing interest in the Club's activities.

A letter arrived today from Bill Tynan W3YO, Contributing Editor for "The World Above 50 MHz". In QST, who commented on my query of the 70 cm Best QST in QST in January 1977, and advises that all the stations shown above the record standing are for EME contacts. However, Bill made the point that there appears to have not been any claims made for the 432 MHz contact with VK3Z8J and Wally VK6WQ in February 1978. If this has not been done, how about you guys having the matter finalised as some VK standings can be made for inclusion in the overseas magazine. We now also have the 23 cm record set recently between Reg VK3OR and Wally VK6WQ on 25/7/77, so I am sure VK amateurs would like to see the records set straight. How about it, chaps, on with the 'rob!

Bill W3YO also asks to be informed of any worthwhile accomplishments in this part of the world for inclusion in QST. World Above 50 MHz, so I will try and remember to do this on your behalf. Perhaps we should start with the VK4RO to KH8GRU contact.

That will have to do for this time, concluding with the thought for the month "Sentimentality is no indicator of a winner. Nothing weeps more copiously than a chunk of ice."

The Voice in the Hills.

as many of the IARU societies did not seem to be as effective touch with their national administrations.

News from IARU headquarters reports that 23 member societies have received indications of favourable response to the amateur position from their governments and 11 out of the 30 societies reporting expected to have amateurs appointed to the governments' WARC delegations in 1979. The French Society R&F reported that French amateurs can now use A1 emission on 1825 kHz solely for international contacts with stations in the 10W. They have also won the privilege of building and installing 2 metre repeaters (16 kHz bandwidth, 200W aip, 144-146 MHz, RI access) after many long and arduous attempts.

Europe's CEPT (the organization through which Europe co-ordinates its telecommunications policies) is thought unlikely to support a 220-225 MHz allocation and a hard struggle is expected for 50-54 MHz between the amateur and mobile services. If TV moves away from this segment, VERON (Netherlands) cannot expect to receive more than 10 MHz in the 160m band.

In South Africa the portion 1830-1870 MHz might be supported for amateur use but not on an exclusive basis. The indications are that it is going to be "extremely difficult" to allocate a portion of the 80m band exclusively to amateurs due to sharing with fixed, mobile, defence and private services. On 40m the segment 7000-7150 kHz for strict-use amateur use might be possible but the proposals for 10.1-10.6 and 18.1-18.6 MHz were rejected due to several service sharing segments for long-distance communications but the proposal for 24.0-24.5 MHz seemed more favourable. The use of 220-225 MHz is out but 2300-2310 and 3400-3410 MHz as amateur satellite bands were considered to be acceptable by the South African PMG.

Indications from Sweden show problems about the 14.0 and 7 MHz proposals, although the administration reacted favourably towards the 14.21 and 28 MHz proposals.

In Switzerland the authorities appear to be against 10 and 16 MHz bands as well as 50 and 220 MHz, but some support was detected for the proposed 24 MHz band. Many difficulties appear in relation to the revision of the 70 cm band for amateurs, reports USKA, except for the satellite amateurs, reports VKSA, except for the satellite window.

The Canadian first draft for WARC 79 touches on several points of significant interest to amateurs. The three new bands at 10, 18 and 24 MHz are provided for but the 80m allocation is reduced to 3.5-3.8 MHz exclusive and for 40m, 9.7-11 MHz exclusive.

April 1977 QST contains an article by David Sumner K1ZZ on the AARL response to the FCC WARC 79 frequency proposals (already referred to in AR side FCC Docel 20271). Several of the taboos with the article appear very apt.

"If one service is to expand, another must surrender spectrum space. Fixed service needs will be far less after 1985 than they are today. Better techniques could improve the utilization of existing frequencies but the FCC has not yet decided if it needs for new amateur allocations at 10, 18 and 24 MHz. The sharing arrangements with the fixed service is a realistic solution to the problem of expanding one service without seriously impairing another. A shift in the 15m band is unnecessary and undesirable. Sharing between amateur and CB at 220 MHz is wholly impractical for a number of reasons. The solution for CB lies at 900 MHz where sufficient spectrum space is available for future expansion."

Other comments in this article include such items as "The radio spectrum is a finite resource. There are just too many usable kilohertz to go around, and there are more possible uses for radio than can possibly be accommodated. In addition, the representatives of every radio service argue that they need, at minimum, the spectrum that is now allocated to them, and usually that they need a lot more for present and future requirements. If one service is to expand, it follows that some other service's policies must be altered. Under strict spectrum space. Since the last general WARC in 1959, the most heavily used circuits in the fixed service have shifted at an ever increasing rate to overseas

cable, baseline, microwave links and satellites. All of these alternative methods of communication provide higher quality and greater capacity than is possible below 30 MHz. For example, a single geostationary satellite now has a bandwidth of 500 MHz, more than 18 times the width of the entire HF spectrum. The developing nations, according to the FCC, will have a large and continuing need for fixed service allocations only.

The amateur service is expanding world-wide at a rapid rate, projections show that a total of six million amateur stations by the year 2000 is quite likely.

Above 30 MHz the major battle that is shaping up . . . pits the UHF TV broadcasting interests against the land mobile community.

These various extracts hopefully illustrate a few of the massive problems arising for WARC 79 amateur radio consideration. There are at least 10 times more still unmentioned.

Thanks go to David Rankin, the Secretary of the RS Association, for the update on IARU members and other societies in his letter to the editor in last month's AR. It is most pleasing to note the increased membership.

WIRELESS WATCH

Al Chandler, VK3LC

Reference the pulse transmissions that have been bugging us for the past year or so, as I said in the March 1977 issue of AR I thought that would be the last time I would have to mention the subject. However, that signal is still annoying most amateurs and covers an entire band when being transmitted. Although the Russian Administration has been told in no uncertain terms how the signal interferes with the amateur as well as other services they still persist in their experiments and many amateurs in Alaska have reached the level of frustration where they have given up hope that anything can be done about it.

However, I ask all observers to continue to report the pulse whenever it is heard, giving date, time, frequency range, strength, and it possible bearing because useful complaints are at it being forwarded to the Administration concerned.

Now, I am going to quote what is being said in other parts of the world. In England I quote from "Wireless World" — "It is now common knowledge that a large portion of the HF band of the radio frequency spectrum has been suffering from interference caused by a very powerful transmitter, or transmitters, located somewhere in Russia or the Ukraine. The interference became so bad that most of the communication services have complained through their respective organizations and the Home Office and to the Frequency Registration Board of the ITU. A Home Office representative recently informed us that they have made a complaint direct to the Russian authorities and have been told that they are conducting tests and are taking steps to reduce the interference. We can only speculate, and perhaps the best way to do this is to study the information at hand and then compare it with systems which we know are within the realms of our present technology or could be feasible. Reports indicate that the transmitter is located in the area of Gornal, an industrial town in Byelorussia and this has been confirmed by NATO design findings. Most of the reports agree that the actual powers involved are in the tens of megawatts, probably 20 to 40 mW.

Amateurs and broadcasters have not been the only ones affected by the interference. Almost every service has been troubled. Although the signals are very difficult to observe even on a high speed oscilloscope, they are more easily seen on a spectrum analyzer, the same, or nearly the same. Information perhaps from different locations. What is interesting is that the signals are no longer remaining for periods of hours in one frequency band but are moving up and down the HF spectrum in about 100 kHz steps, remaining at the chosen frequency for 30 seconds to 10 minutes. The use of pure signals suggests over the horizon but a complicated system would be necessary to compensate for propagation variations, and the may

WORLD NEWS

WARC 79

Writing in Radio Communication, February 1977, about the Region 1 VHF Managers' meeting in Amsterdam, a report indicated that with regard to WARC 79 the position was somewhat depressing

MAGAZINE INDEX

Syd Clark, VK3ASC

BREAK-IN March 1977

Frequency Measuring Contests; Yet Another Electronic Filter; Inductive Reactance for Copper Winding Wires; Crystal Filter; Faulty Electrical Apparatus Can Kill

CO March 1977

DXccs Okinawa Style; Electromagnetics Made Interesting or Comes Next Not Born; Front Panel Adjustment for Sine Tuned Coils; A 100 Watt Switch-Mode Regulator; Build a Three-Phase Antenna; Amateur Radio Operation from Apartments and Motels; The Multi-Band Trap Antennae—Part 2; No Harry, AM, a Not Dead

CO May 1977

VK3XX DXccadition to Christmas Island; The Multi-Band Trap Antennae—Part 4; Filament Voltage: What is it? I Am Curious, Infrared; The Silk Purse In-Lie Waitmaker

HAM RADIO January 1977

Single Sidedband FM; Direct Conversion Receiver; Ground Plane Antennas; Matching Techniques for Solid State RF Power Amplifiers; Five Band SSB Transmitter; Automatic Up/Down Repeater Mode; Simple Diode Tester; Q Measurements; Solar Power Source; Computing VSWR Indicator; Microprocessors: The Vexed Interrupt

HAM RADIO February 1977

RX Notes Bridge Improvements; Portable CMOS Counter; Iterate 30 ohm Terminals Fixed Frequency Receiver for WWV; ATU Cancellation Generator; Custom Capacitors for Homebrew Projects; Isolating Parasite Currents in RF Amplifiers; Silver Plating Made Easy; Bandspreading Techniques for Resonant Circuits; Portable Keyer Paddle Troubleshooting; Logic Cereals; Microcomputer Interfacing; LC Circuit Calculations; IC Tone Generator

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TVI Sleuths at Work; Cordis a 1; A Time-Delayed Tone Decoder; Inexpensive Traps for Wire Antennas; Understanding Linear ICs Radio Propagation and its Activity; Cycle 21—Four Divergent Views; TR-40 Outboard Receiver Modification; A Control System for Your Station; Simple and Economical; RTTY Distribution and Control Box; Solid State BC-221 Frequency Meter; Build This Solid State PA for 40 MHz

QST March 1977

Homotomizing—DX Style; The CB Side; The Equalizer; Understanding Linear ICs; Using the Heath SB-650 Frequency Display with the Yaseu FT-101; A 1200 MHz Signal Source; A Rebuilt HRO; RTTY—What is it? A Low Power 80 MHz Transmitter; Your Nicest Kind of Linear Tuning; De-regulation—Another Round Getting to Know OSCAR—From the Group Up Regulations Revisited; Centennial Celebration; So Joining for the Future

RADIO COMMUNICATION February 1977

A 70 MHz Transistorized Transmitter/Receiver Converter; Improving the Selectivity of a Rebuilt HRO; RTTY—What is it? A Low Power 80 MHz Transmitter; Some Experiments with High-Frequency Ladder Crystal Filters

RADIO COMMUNICATION March 1977

A Third Method SSB Generator; Modifying 120/180-L ne SSTV Equipment to Transmit and Receive 240/256 Line V-ded; Monitoring for Accurate Propagation

gation; The Yaseu FRG7 Receiver; RTTY—Beginners' Terminal Unit

RADIO COMMUNICATION April 1977

The GPLX Mk. 2 RTTY Video Display Unit; Simple Alignment for Drake 4C Receiver; Amateur Television; The "Disappearing Inductance" A New Trick and Some Better Bonds

RADIO 25 January 1977

Shoot for the Horizon; South African VHF Beacon Stations; Unknown Transistors

RADIO 25 February 1977

A Homebrew Two Element Cubical Quad; SHORTWAVE MAGAZINE; Digital Switching Indicator; Aerial Selector Switch; Terminal Unit for RTTY; Shack LV Power Unit

SHORTWAVE MAGAZINE February 1977

The Other Man's Station; RAE Q & A; Thirty-first Annual MCG

REPEATERS

Ken Jewell, VK3AKK

Peter Mill, VK3ZPP

FEDERAL

At the recent Federal Convention it was agreed that the recommended deviation for FM simplex nets and repeater channels will be ± 7 kHz peak.

The need for more repeater channels was referred back to the FRAC as a matter of urgency.

The corrections to the repeater directory that have been received will be included when it is reprinted in the Call Book.

NEW SOUTH WALES

After consultation with the VK3 Repeater Committee, Griffith was allocated channel 5. It is hoped that base stations in the area between the Griffith and Macdonald repeater areas will be responsible and not interfere with one system while operating into the other system, band openings being the exception.

VICTORIA

Bendigo has filed audible identification. They have also been experimenting with a proportional tail, which depends on input signal strength. (The stronger the signal, the shorter the tail—Ed.) Until the duplexer is tuned and fitted there will be an imbalance and the repeater will appear dead in some directions. This is due to the TX aerial being on the top of the tower and the receiver aerial on the north side of the tower approximately 100 feet below.

Swan Hill have fitted a solid state repeater but are having trouble with over-heating.

East Gippsland's repeater has been operating unattended for over five months using solar cells. They are having desensitizing problems but hope to fix it with a couple of filters.

SOUTH AUSTRALIA

Mt Gambier now has a licence to test. The RX-TX are finished and the control and ident are nearing completion. David VK5ZSO reports that it is not another "Wattle Packet Special", hence the delays.

TASMANIA

Uverston is having difficulties with cavities. The repeater is finished but has been delayed by a 22 VV line falling across the 230V line. They will be using half wave dipoles.

The information in this column might appear loaded from State to State, but we can only print what is supplied. We cannot make it up.

CONTESTS

Kevin Phillips, VK3AUQ

Box 87, East Melbourne, 3002

CONTEST CALENDAR

July

9/10	IARI Rad sport Championship
9/10	RASST SEANET WW DX CW Contest
18/17	Colombia CW Contest
18/17	10-10 Net QSO Party
23/24	County Hunters CW Contest
30/31	Venezuelan CW Contest

August

13/14	*REMBREANCE DAY CONTEST
13/14	European CW Contest
20/21	RASST SEANET WW DX Phone Contest
20/21	SARTG RTTY Contest
27/28	All As an CW Contest

September

10/11	European Phone Contest
17/18	Scandinavian CW Contest
24/25	Scandinavian Phone Contest

October

1/2	*VK1ZJ/Oceanic Phone Contest
8/9	*VK1ZJ/Oceanic Contest
15/16	Manitoba QSO Party
23/30	CQ WW DX Phone Contest

COLOMBIA CONTEST

Starts 0001 GMT Sunday July 16 and ends 2359 GMT Sunday July 17. The contest commemorates the 167th Anniversary of Colombia's independence. All bands 3.5 to 28 MHz, phone and CW, may be used. Classes are (a) single operator single band, (b) single operator all band, and (c) multi operator single band. Exchange RST and a 5 figure serial number starts each log. CQs with Hx are worth 5 points, North America 3, other countries 2, and with same country 1 point. The multiplier is the sum of DX countries worked on each band. Final score is the sum of QSO points from all bands multiplied by the sum of different countries worked on each band.

Use separate log sheets for each band. Indicate the country only the first time it is worked, and include a summary sheet showing scoring and signed declaration. Send logs by September 30 to LCRA Concurso Independencia, Apartado Postal 564, Bogota, Colombia.

SARTG RTTY CONTEST

Three periods GMT 0000-0800 and 1800-2400 Saturday, August 20, 0800-1500 Sunday August 21. Use all bands 3.5 to 28 MHz. The same station may be worked on each band for QSO and multiplier credit. Classes are single and multi operator single transmitter and SWLs. Exchange QSO No and signal report. QSOs with own country count 5 points, with other countries on the same continent and other continents 15 points. The US, Canada and Australia call areas count as separate countries for scoring. Each DXCC country, VK/VL VE/VO and VK call area count as multipliers. Final score is the sum of QSO points times the multiplier for each band. SWLs use same scoring but based on stations and messages copied. Certificates will be awarded to the highest scoring stations in each country, US, Canadian and Australian call area. Use a separate sheet for each band and include a summary sheet showing scoring and other essential information, and your name and address in block letters. Send logs to SARTG Contest Manager, C. J. Jensen OZ8JZ, Miesnerstraße 5, 8600 Rends, Denmark. Logs must be received by October 10.

REMEMBRANCE DAY CONTEST - 1977 - RULES

REMEMBRANCE DAY CONTEST 1977

A perpetual trophy is awarded annually for competition between Divisions of the Wireless Institute of Australia. It is inscribed with the names of those who made the supreme sacrifice and so perpetuates their memory throughout Amateur Radio in Australia.

The name of the winning Division each year is also inscribed on the trophy and, in addition,

the winning Division will receive a suitably inscribed certificate.

OBJECTS

Amateurs in each VK call area, will endeavour to contact other amateurs—

1. in other VK call areas, P29 and ZL on all bands 1.8 through 30 MHz.

2. in any VK call area (including their own),

P29 and ZL on authorized bands above 52 MHz and as is indicated in rule 5.

CONTEST DATE

0800 hours GMT on Saturday August 15, 1977 to 0759 hours GMT on Sunday August 15, 1977

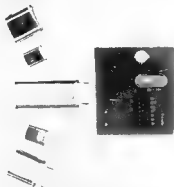
All Amateur stations are requested to observe 15 minute silence before the commencement of the contest on Saturday afternoon. An appropriate

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1 16	1/2	16	3	No 3003	99c
2 08	3/4	8	3	No 3005	\$1.15
2 16	3/4	16	3	No 3007	\$1.15
3 08	3/4	8	3	No 3010	\$1.40
3 16	3/4	16	3	No 3011	\$1.40
4 08	1	8	3	No 3014	\$1.56
4 16	1	16	3	No 3015	\$1.56
5 08	1 1/4	8	4	No 3018	\$1.75
5 16	1 1/4	16	4	No 3019	\$1.75
8 10	2	10	4	No 3907	\$2.52

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Input Power 100W nom. 5-20W PEP range
Output Power 100W nom., $\pm 1/2$ dB across band, 200-250W PEP output
Input impedance 50 ohm nom., adjustable to match excitor range under 2:1 across band
Output impedance 50 ohm nom., up to 3:1 VSWR acceptable with little degradation
Current Drain 16 A nom., 20 A supply recommended at 13.6V DC
Power Supply 13.6V DC recommended for best results, 13-14V DC acceptable positive or negative to ground
Pre-amp 16 dB nom. gain across entire HF band, 15 dB typ. at 50 MHz, 3-4 dB NF
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broadcast will be relayed from all Divisional stations during this period.

RULES

1 There shall be 4 sections to the Contest:

- (a) Transmitting Phone
- (b) Transmitting CW
- (c) Transmitting Open
- (d) Receiving Open.

2 All Australian amateurs (VK call signs) may enter the contest whether their stations are fixed, portable or mobile. Members and non-members of the Wireless Institute of Australia are eligible for awards.

3 Amateurs may use these modes:

- (a) Phone
- (b) CW
- (c) RTTY
- (d) TV (fast and slow scan).

However, only one entry may be submitted for sections (a) to (c) in rule 1. An open log is one where points are claimed for more than one mode. AM, SSB and FM are grouped as one mode, i.e. Phone.

4 Cross mode operation is permitted but both stations may only claim points as for a phone/phone contact. Cross band operation is not permitted via a satellite repeater.

5 Scoring:

(a) On the 3.5, 7 and 14 MHz bands a station in another call area may be contacted once on each band using each mode. That is you may work the same station on each of these bands on Phone, CW, SSTV and RTTY.
(b) On the 1.8, 21, 27 and 28 MHz bands, a station in another call area may be contacted twice on each band using each mode provided that not less than 12 hours has elapsed since the previous contact on that band using that mode.

(c) Between 1600 hours GMT and 2100 hours GMT on Saturday, intra call area contacts may be made on the 1.8, 21, 27 and 28 MHz bands once for each mode on each band.

(d) Between 0300 hours GMT and 0700 hours GMT on Sunday, intra call area contacts may be made on 1.8, 21, 27 and 28 MHz bands, once for each mode on each band.

(e) On the bands 62 MHz and above, the same station in any call area may be worked using any of the modes listed in rule 3 at intervals of not less than 2 hours since the previous same band/mode contact. However, the same station may be contacted repeatedly via satellite not more than once by each mode on each orbit.

(f) All CW/CW, SSTV/SSTV and RTTY/RTTY contacts count double. Note rule 5 re cross mode contacts.

6 Multi-operator stations are not permitted, although log keepers are allowed. Only the licensed operator is allowed to make a contact under his/her own call sign. Should two or more licensed operators wish to operate any particular station, each will be considered as a contestant and must submit a log under his own call sign.

7 Club stations may be operated by more than one operator, but only one operator may operate at any one time, i.e. no multi-transmissions. All operators must sign the declaration.

8 Entrants must operate within the terms of the regulations.

9 Cyphers: Before points may be claimed for a contact, serial numbers must be exchanged and acknowledged. The serial number of 5 or 6 figures will be made up of the RS (telemetry) or RST (CW) reports plus 3 figures that will be incremented by one for each successive contact. If any contestant reaches 999, he will start again with 001.

10 Entries: Must be set out as shown in the example, using one side of the paper only, and standard WIA log sheets if possible. Entries must be clearly marked "Remembrance Day Contest" on the envelope, and must reach the Federal Contest Manager, WIA, Box 67 East Melbourne 3002, in time for opening on Friday September 10, 1977. Early submission of logs will be appreciated.

11 Terrestrial Repeaters: Contacts via terrestrial repeaters are not permitted for scoring purposes. However, contacts may be arranged through the repeater and if successful on another frequency, that contact counts for scoring purposes.

12 Portable Operation: Log scores of operators located outside their own call area will be credited to that call area in which operation takes place, e.g., VK5XY/2. His score is added to the VK2 scores.

13 All Logs shall be set out as in the example shown, and in addition MUST carry a front sheet showing the following information:

Name
Address
Callsign
Claimed Score
Number of contacts
Declaration: "I hereby certify that I have operated in accordance with the rules and spirit of the contest".
Signed
Date

All contacts made during the contest must be shown in the log submitted. If an invalid contact is made, it must be shown, but no score claimed. Entrants in the "Open section" must show the various mode contacts in numerical, i.e. chronological order.

14 The Federal Contest Manager has the right to disqualify any entrant who during the contest, has not observed the regulations or has consistently departed from the accepted code of operating ethics. The Federal Contest Manager also has the right to disallow any illegible, incomplete or incorrectly set out logs.

15 The ruling of the Federal Contest Manager of the WIA is final and no dispute will be entered into.

AWARDS

Certificates will be awarded to the top scoring stations in sections (a) to (c) of rule 1, in each call area, and will include the top scorer in each section of each call area operating exclusively on 52 MHz and above. Each VK, ZL and P29 call area

will count as separate areas for awards. There will not be an outright winner. Further certificates may be issued at the discretion of the Federal Contest Manager.

The Division to which the Remembrance Day Trophy will be awarded shall be determined by the following formula:

Average of top 6 logs plus (1000 times total points score from all entrants from call area in sections a, b and c of rule 1 divided by the total call area licences).

VK0 scores are added to VK7 and VK6 to VK5. Scores by VK0 stations are added to the main land call area geographically nearest. Scores claimed by ZL and P29 stations are not included in the scores of any VK call area.

Acceptable logs for all sections shall show at least 5 valid contacts. The trophy shall be forwarded to the winning Division in its container and will be held by that Division for the specified period.

RECEIVING SECTION (Section 5)

1. This section is open to all Short Wave Listeners in Australia, Papua New Guinea and New Zealand, but no active transmitting station may enter.

2. Contest times and loggings of stations on each band are as for transmitting.

3. All logs shall be set out as in the example. It is not permissible to log a station calling "CQ". The detail shown in the example must be recorded.

4. Note the times and conditions set out in rule 5.

5. Club stations may enter this section. All operators must sign the declaration.

AWARDS

Certificates will be awarded to the highest scorers in each call area. Further certificates may be awarded at the discretion of the Federal Contest Manager.

EXAMPLE OF TRANSMITTING LOG

Entered/GMT	Band	Mode	Callsign worked	RS(T) sent	RS(T) rec'd	Points
-------------	------	------	-----------------	------------	-------------	--------

EXAMPLE OF RECEIVING LOG, VICTORIAN SWL

Date/Time GMT	Band MHz	Mode	Callsign heard	RS(T) sent	Station called	Points
14 Aug 77						
0612	7	P	VK5PS	59002	VK6RU	1
0615	7	CW	ZL2AZ	59004	VK4KI	4
0618	14	P	VK0ZZ	57006	VK6FI	6
0624	14	P	VK6FI	58004	VK0GB	5
1820	28	P	VK3WF	59077	VK0ZZ	1
15 Aug 77						
0750	1.8	CW	VK3YQ	59000	VK3XU	2
0754	28	P	VK3YX	56157	VK3ZCX	1

SCORING TABLE FOR PHONE CONTACTS — ALL CW/CW, SSTV and RTTY CONTACTS COUNT DOUBLE

From	To	0	1	2	3	4	5	6	7	8	9	P29	ZL
VK0	—	6	6	6	6	6	5	5	5	5	5	5	5
VK1	6	—	2	3	3	4	4	4	4	4	4	4	4
VK2	6	2	—	1	1	2	3	2	4	4	4	4	2
VK3	6	3	1	—	2	1	3	2	4	4	4	4	2
VK4	6	3	1	2	—	3	5	4	3	3	3	3	3
VK5	6	4	2	1	3	—	3	2	3	5	5	5	4
VK6	6	5	3	3	6	3	—	4	5	5	5	5	5
VK7	6	4	2	2	4	2	4	—	4	6	5	5	3
VK8	6	6	4	4	3	3	5	4	—	3	4	5	5
VK9	6	5	4	4	3	5	5	6	3	—	6	5	5
P29	6	5	4	4	3	5	5	5	4	6	—	5	5
ZL	6	3	2	2	3	4	5	3	5	5	5	—	5

Read table from left to right to work out points for the various call areas.

ALL INTRA-CALL AREA CONTACTS ON 52 MHz AND ABOVE, OR AS INDICATED IN RULES 5(c), (d), and (e) are worth one point.

IONOSPHERIC PREDICTIONS

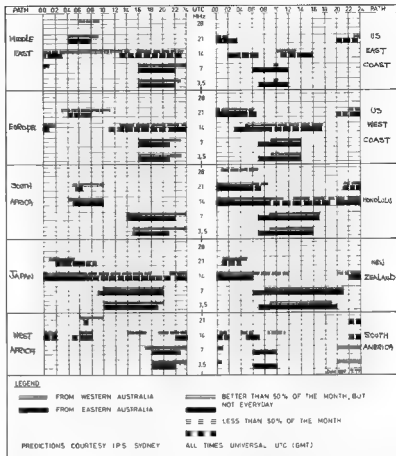
Len Poynter, VK3ZGP/NAC

For the statistically minded we have now gone through the sunspot—minima in July 1976 with a running smoothed number of 12.4. Generally, so far as solar activity was concerned, 1976 was the year of lowest activity with some very active periods and some very inactive periods.

The brighter side is that conditions are on the improve and it has brought to light some very interesting propositions as to how the new cycle will perform. Of course whilst you have experts you have diverse theories and of course in proportion—projections. In February 1977 QST an interesting article appeared challenging the projections of many experts in as much that cycle 21 could be equally as good as cycle 19—remember that big one back in 1959? Let me quote the final paragraph of the article: 'Many other estimates of the upcoming solar activity have been that it will be much lower than the last cycle, which peaked in 1958. If this were to be true the 6 metre band would be effectively unusable for F-layer DX, and the 10 metre band would be marginal, at the best, a good part of the year. Our analysis indicates that the next cycle of solar activity MAY even soar above the 1957 level. If this happens the 6 metre band will be useful for F-layer distances a record period in time. A more cautious estimate still places the level of activity for the new cycle well above the 1958 peak as frequent openings would be expected.'

A summary of some authoritative estimates for cycle 21. Glassberg of the Astronomical Institute of West Germany. Cycle 21 to peak between 3779 and 5780 with a mean between 50 and 85. Cohen and Linz predict the next maximum at around 55. Smith G8KG predicts cycle 21 to equal at least cycle 20 and could even reach 150. Hill, of the Naval Electronics Laboratory Centre in San Diego, predicts cycle 21 to begin in late 1976 and at its maximum to reach at least 130 and possibly as high as 200 (refer to the previous quotation).

Naturally there are as many predictions as there are researchers in the field of solar activity. Summing up they range from a low 40 to a high 200. It is important to realise that so far research is still a new science. Important data pertaining to solar effect on HF communications are still awaiting discovery. It is stated that a common misunderstanding has in the belief that sunspots are the CAUSES of changes in band conditions. There is something else that is responsible for these changes but as yet science has not discovered what that "something else" is. Awaiting that discovery, we still use the sunspot number tool for determining



general band conditions on a long term basis.

It's going to make interesting study over the next four to five years just how the whole range of theories will result. But the new cycle is definitely on and conditions generally are improving so make DX while the sun shines.

Predictions of smoothed monthly sunspot numbers: July, 18, August 19, September 20, October 21, at May 2 1977.

Sunspot data courtesy Dr Waldmeyer, Swiss Fed Observatory, Zurich

AWARDS COLUMN

Brian Austin, VK5CA

P.O. Box 7A, Graters SA, 5152

WAA AWARD (Brazil)

General

- The award is available to licensed amateurs.
- Contacts from November 1945 are valid.
- Do not send QSL cards. A list showing full details of the contacts should be sent to the Awards Manager of a National Society, a Radio Club Officer or a notary public.
- All contacts must be made from the same call area or where no call area exists, from the same country. Also, if the licensee moves to another country, all contacts should be made within a radius of 150 miles (240 km) of the original location.
- There is no fee for the award. It is suggested that 2 or 3 IRC be sent to help defray expenses.
- The address for applications is:

Post Box 2353,
2200 Rio de Janeiro GB,
Brazil

Requirements:

Confirmed contacts are required with 45 on the countries in the countries list:
C, CE0—Easter Island
CE02—Juan Fernandez
CE03—San Felix
CE04, K25, LU, OX, PJ—N. Antilles.
HI, HI, HK, HKD—San Andres and Providencia.

HK0—Melpelo
HK0—Bajo Nuevo
HP, HR, K3W, KC4—Navassa.
KG4, KL7, KP4—Swan.
K54—Serrana Bank.
FZ, TG, TI, T3B, VE, VO, VP1, VP2A, VP2D, VP2E, VP2S, VP2K, VP2L, VP2M, VP2S, VP2V, VP7, VP8—Antarctica.
VP8—Falkland.
VP8—S. Georgia.
VP8—S. Orkney.
VP8—S. Sandwich.
VP8—S. Shetland.
VP9, XE, XF, YN, YS, YV, YV0—Aves Is.
ZF1, ZP, ZF, 8P, 8R, 9Y.

AROUND THE TRADE

R. M. Cunningham Pty. Ltd. have advised that they are the sole Australian agent for the Watkins Johnson Company of the USA.

One of the latest receivers available is the WJ888 HF synthesis receiver covering 500 kHz-30 MHz with digital readout.

The receiver is designed for the reception of AM, FM, CW, SSB emissions. Up to 6 IF bandwidths may be selected via front panel push-button switches. The seven digit LED readout resolution of the display is 10 Hz over the entire tuning range. Front panel controls include main tuning, IF bandwidth select, gain mode, detection mode incl. AML, select RF gain, SB audio select, audio level, squelch and variable BFO control.

QSP

GJ PREFIX

To help celebrate the centennial year of Japanese-Canadiana DQC has authorized the use of the prefix GJ in lieu of VE or VO by all Japanese Canadian radio amateurs during 1977. QST March 1977

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1. A Mo. 1 V-1 2m transceiver 146 148MHz in 23 channels, 10 watt output, h.v. sensitivity. Supplied with one free set of rocks on ch 40

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Cat D-4620

3. A magnetic mobile base to suit above antenna, complete with lead away. Normally sells for \$25.00

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Cat D-4066 save \$1.50 . . . \$3.50

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Cat D-4910 save \$4.00 . . . \$4.50

RAK 2m antenna, type 825, 5/8 wave

Cat D-4811 save \$5.75 . . . \$6.75

RAK 6m antenna, type 465, 1/4 wave

Cat D-4814 save \$5.74 . . . \$5.75

LA6020 antenna, 6 & 2 metres

Cat D-4820 save \$10.00 . . . \$12.50

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Cat D-4622 save \$10.00 . . . \$15.00

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QSP

VALVES

It is predicted that the price of small tubes will soar as a result of reduced competition, and the high prices for these items are already being felt in the US. Like it or not, semiconductor are here! An article in March 1977 QST about the downturn in valve manufacture which has resulted in the closure of several US tube plants.

QST MARCH 1977 DETAILS AND COMMENTS ON FCC

docs 11033 which proposes further deregulation of amateur repeaters. Amongst the items are such things as 10 minute identification intervals instead of 5 minutes; allow repeaters on all amateur frequencies except 435-438 MHz and revise the rules which emphasize that a station occupying a frequency has first priority to the concept that all frequencies must be shared.

CANADIAN PROPOSED RESTRICTIONS

DOC proposed regulation amendments seek control over the sale and use of external RF power amplifiers and of emergency beacons for 121.5 and 243 MHz. One paragraph prohibits use of devices to boost the output of a CB station. Emergency beacons were intended for use by downed aircraft and sinking ships only, but having been purchased by hunters and others, there have been inadvertent operations and false alarms increasing enormously with corresponding increases in expenses to search and rescue units. April 1977 QST

OSCAR 8

"In order to maintain the many ongoing amateur satellite programs, especially the Education Program that brings the excitement of live satellite communications into schools across the US and Canada, another OSCAR should be launched as soon as possible. ARRL has agreed to reimburse AMSAT for \$50,000 of its development and construction costs for AMSAT-OSCAR D provided the spacecraft achieves the desired orbit and functions properly. Additionally, the League will take over licensing and operational management. With ARRL's backing the eighth amateur satellite should meet its November launch schedule, while allowing AMSAT volunteers to continue work on the revolutionary Phase III satellite." Extracts from a report in April 1977 QST

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KENWOOD TS-700-A 2m
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FUKUYAMA FDK QUARTZ-16
2m, 24 channel FM trans-
ceivers, the replacement for
the discontinued MULTI-7,
complete with crystals for all
repeater channels 1 to 8 incl.
plus channels 40 & 50 \$186

DRAKE SSR-1 Wadley loop,
0.5 to 30 MHz receivers,
AC and batteries \$200

MEDALLION AM/FM Stereo/
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Sideband Electronics Imports

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N.S.W. 2777

LETTERS TO THE EDITOR

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publishers.

The Editor,
Dear Sir,

IS AN AMATEUR AN AMATEUR?

This letter is written after a considerable time spent recently in solitary confinement in a forestry fire watch tower. There will be no apologies made to anyone as I am a firm believer in speaking one's mind (and allowing others to speak theirs). Intermingled with my comments is a random sprinkling of veiled extracts from various reputable and not quite so amateur-oriented magazines.

I will not quote the very tired and never ending dictionary versions of the words "ham or amateur" as I am sure that everyone has had as much of this philosophy that it becomes almost laxative by nature. For those who insist on that extra reassurance, I refer you to the very excellent definition in the "Handbook for Operators of Radio Stations in the Amateur Service". Do you fill the definition?

FINANCIAL

To continue with my thoughts, I ask a seemingly rare and more important question of my fellow amateurs. Who amongst you are at all interested in electronics (and has not married money) has a bank balance to speak of? If our commercial benefactors had their way, I am sure that they would have everyone out working eight days a week in order to finance a new "Super Gizmo Mk. 2" for some project or another.

DOGMA/TISM

My next observation is that of the skill demonstrated by some of being dogmatic to the extreme, particularly when it is required on that particular subject and suddenly there exists a void in place of the abundance of never ending verbiage. To these people, I can do but one thing, and that is to offer the gambler's philosophy of "Put up or shut up". Surely you must realise that not only you damage your own personal standing within our ranks but to the service in general.

The above comments are not intended to imply that a person is not entitled to a viewpoint, but before plying your fellow amateurs with it, be prepared to give your backing to your philosophy. No one in their right mind would suggest that thoughts and philosophies should be inflexible, however, a large number of people in sole regard are as reliable as stable prices in some of our supermarkets.

LICENCE JUSTIFICATION

Not many amateurs can honestly say that they have had even a mediocre sense of technical achievement recently, and I do not mean the thrill or otherwise of operating your store bought appliance. Further to that last point, if you, like a large majority (myself included) own or operate a commercially manufactured device, could you explain in detail just how it works stage by stage? I would not go so far as to say that you should be able to do all the repairs, as quite often this requires test equipment not available in quite a large number of shops. Even so, is it not time you justified your technical existence?

ON AIR MANNERS

My next subject is that of "on air" manners. My next only applies to the communal frequencies, i.e. repeaters, but all bands that are available to us. Quiet often a comment is made by a person in the course of a conversation that is not directly in line with the thoughts of a listener. There exists our friendly society, along with the censored ducks, cats and other forms of on air jamming, the individual who insists on overriding a discussion to air his own point of view without being asked, and equally unfortunately, with a goodly dose of animosity.

To the people, along with the radio knob who will not talk to another station in particular unless put in a situation where it is impossible to get out of it, I will not offer humanitarian pity as you do not deserve it. Here I think that eventually even

though you are causing discomfort to others, you will surely bring about your own downfall in the time to come.

Further on the subject of manners, quite often during discussions an "air" comment will come up and call for a "break" between operators of the stations concerned. How many times have you heard the stations concerned tell the breaker to go ahead just in case there is some urgent traffic, or is the breaker acknowledged and the conversation continued regardless? Don't fool yourself, it happens all the time.

COMMUNICATION

In the course of operating your station, have you ever asked yourself whether or not you are communicating or are you just talking at someone? So many times I have heard large lumps of syllabic garbage that has absolutely no relation or bearing on the conversation at hand. Now this brings me to the point of how often or how long has it been since you went out of your way to help or to try and understand the interests of your fellow amateurs? There are so many and varied interests and fields to specialize in that one can become involved with, that it would be impossible to be conversant with them all. However, it is surprising how much you can learn once you listen and learn to communicate. It is surprising just how much that can be learned if one takes or makes the effort.

RADIO RABBITAGE

My next victim in this crusade is the cause of amateur radio's equivalent of golfing's grass widow, and here I refer to the radio rabbit. This individual is usually completely devoid of life's responsibilities around him and anything that does not further his slave like attitude to his master just does not interest him. Perhaps this is extreme, but how many times have you asked your good lady (or other) to do something for you and it has been done straight away and without hesitation? How many times has your good lady, child or other, asked you to do some task and you have said "OK in a minute", which by the way will invariably turn into hours or in some cases will be done at all. On this particular point, I think that we are all guilty at some time or another but it is certainly a point worth watching. Just remember, amateur radio is a communicating device not necessarily a communication one.

PARASITES

This following section is dedicated to the radio parasite. It would appear that there is an ever growing number of these do-nothing self confessed fence sitters, who do nothing except sit home, and offer nothing to the service that, like it or not, they are part of. The time has come when concerted effort to remove both the parasites and the parasite types from the system. Firstly, in order to remove the parasites who do nothing for amateurs in general, perhaps we (all amateurs) should be required to prove to the relevant authority within two years that we are indeed technically competent and capable of justifying the piece of equipment that adorns the wall of the shack. By doing this the implication is that if an individual cannot prove satisfactory that he is competent in at least one of amateur radio's facets, his licence to operate in the medium could be held in abeyance for a period of say twelve months while the person concerned has the opportunity to rectify the situation. If, however, this is not possible, then the licence should be suspended. This would have two effects:

1. Provide adequate incentive for amateurs to keep with it.
2. Ensure that only people genuinely interested in this self-educating medium remain.

To remove the paranoid from our ranks is for all intent and purposes impossible, however, it is by members carefully considering the various people that are voted to office and then allowing them to do their appointed tasks that these types will eventually have a minor role in our organisation. So next time you exercise your democratic right to vote, vote for the person whom you honestly believe will do the best for the service in general, not just you.

CONCLUSION

If you have read this far, you deserve an explanation of why this letter was written and not just

scribbled by a madman orator. While on the surface of things it would appear that I am attempting to deliver a sermon and otherwise belittle the amateur service, I truly believe that unless some of these things are brought forward in such a manner, complacency in some people will reign supreme. Furthermore, it was written to create comments (adverse or otherwise) and to hopefully instill a desire in as many people as possible within our ranks to at least think and ask themselves whether or not with all of their convictions they are being honest with themselves and above all else, do the scales of give and take come to rest unilaterally on the giver side? I hope for all our sakes they do.
I am Foster VK3JY, Watts Road, Nicholson, 3582 Victoria.

The Editor,

Dear Sir,

With regard to the John Moyle Memorial Field Day contest. We, the Wagga and District Radio Club, would like to express our disappointment regarding the overall activities and also the scoring system.

Under the club call sign VK2WG, we took the trouble to find a mountain which would give us suitable coverage for VHF. The site chosen was a mountain some 20 miles east of Tumut, and some 80 miles from our home town Wagga Wagga. This site was chosen after it had been proved in the mid-winter of 1976 that stations in Sydney were worked on channel 40 FM with 8 watts into a five element beam. So believing the John Moyle contest to be the contest of the year, and most certainly the event of the year for our club, we made the effort to participate as a portable station.

During the 24-hour period which we operated the Dural beacon could be heard at all times but it did not mean that stations would answer our CO on 144.1 MHz. If it wasn't for the Simplex FM channels and the VK1 boys our score would not have been anywhere near what it was.

The following was discussed by our club executive:

1. The scoring system as it is gives no incentive for any operator to even try. If one set up on the State border and worked stations just a few miles away, one can score far more than someone working 100 miles. We feel some change is needed in this area.
2. The mid-summer contest is too close to the John Moyle contest and these could be combined using the same set of log sheets. Alternatively have them further apart.
3. Publicity for the contest seems to be lacking and we feel more could be done in this area.
4. Apathy of amateurs. We cannot find the answer to this one, but perhaps the publicity angle might help.

It is the club's view that if there is no change, VK2WG will not be heard at all on the next John Moyle Field Day. This will not only be a portable station on air but one less activity for this club to participate in, which we all look forward to. This is unfortunate as it is club activities like this which hold the club together.

I hope this letter does not create any ill feelings by the volunteers who do such good work checking logs, etc., but as one can appreciate it is not much fun seeing some result for the effort which is then put into the contest.

Hoping something can be done to improve the contest in the future.

Yours faithfully,

J. R. Brill, President,
Wagga and District Radio Club.

QSP

NEW ZEALAND

According to reports in Break-In, April 1977, there were 4,915 licensed amateurs at 31-12-1976. The NZART membership at the same date included 2,686 transmitting members, 394 non-transmitting and 239 overseas. The Society ended the year with a deficit of \$4,319. The largest single item of expenditure was the net cost (after deducting advertising revenue, etc.) of Break-In at \$19,526.

20 YEARS AGO

Ron Fisher, VK3OM

JULY 1957

With the exception of part three of Gordon Bowen's Modifying the ART, all technical articles in the July 1957 issue of *Amateur Radio* were reprinted from American magazines. They did however reflect the thoughts of the time. The first, "Single Sideband: Is It Better than Amplitude Modulation?", written by W2CRR, argues that the real answer is OSB with suppressed carrier. The reasons he concludes are: 1. SSB has no power advantage. 2. SSB will not reduce interference. 3. SSB is much harder to generate. Well, what do you think?

If you have ever had thoughts about tracking pirates the next article could be worth a glance. "The Snop-Loop", a portable DF loop designed for the ten metre band but adaptable to almost any frequency, was described by Claude Maer W6IC, and reprinted from QST.

"The Evils of Multiband Antenna Systems—And the Cure". Low McCoy W1CPC shows how to build up simple band pass filters that will eliminate harmonic radiation. Again reprinted from QST.

On the Editorial page, Federal Executive philosophies on the subject of "Licensees" are given in reference to Radio Amateurs and newcomers in particular.

The SWL section was now under the direction of a well known Victorian listener, Ian Hunt. Ian has since shifted to South Australia and now holds the call sign VK3QX.

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Omega-4 noise bridge, unused, \$15. RPO 3G speech comb filter in case, unused, works very well, \$15. Sony TC900 cassette recorder, with all accessories, as new \$30. Astatic D104 mika, 55. Low-pass filter, ARRL design, \$5. Kyoritsu solid state GDO, 400 kHz to 220 MHz, \$25. Heathkit HP23E AC power supply, unit 58 or HW series, \$25. VEG, \$25. VK3OM, QTHR. Ph. (03) 959 8215.

Power supply 12V 3 amp, commercial, Little Dick, \$20.00. Ph. (058) 82 1638. VK3GT, QTHR.

Drake TR4-C Transceiver, complete with PSU, internal noise blanker, in new first rate condition. National Panasonic cassette recorder, as new, Model RQ-222AS. Keith. Ph. (03) 570 7592.

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QOE046/20, QOE037/20, 8298 valves and sockets; QOE027/5, 6145 valves, UML modulation transformer; Pve 9 MHz SSB filter with crystals. Star SR70GA ham band valve Rf 60m to 10m and 10 to 10.8, 10.8 to 11.2 MHz, 600 kHz segments, 1 KC recode, AM FM SSB, provision for extra segments. Offers and further details: VK2BQJ, QTHR. Ph. (02) 642 0122 bus.

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6L6C Tubes, 10 brand new at \$5 each plus postage, 2 used \$3.50 each. Eric Storr VK2BEK. Ph. (02) 475 5095 after 5pm 26th.

Type 3 Mx 2 Trans/Rcv, 40-100m, 25W CW, 10W AM, xtal. controlled 115-250V AC 6V DC, works well, \$50. AWA MR8A low band FM T/R, unused, single channel, good condition, \$20. Don VK2ADY, QTHR. Ph. (087) 65 9564.

70 R. Crank Tower, h. duty rotor and 2m long yag, \$200. HP54P counter with 100 MHz plug-in \$85. Swan 500C exc. external VFO, VOX built and used. 400 kHz 404C microphone, \$25. Ian Foster VK3YJL. Ph. (051) 96 6511.

Complete Station. 16 months old, package deal only. 100W transceiver, FL2500 linear, Hy Gain D244B antennas, Ham II rotor, leader monitor CRO, Drake watt-meter W4, Heathkit dummy load, frequency meter, digital, electronic keyer, paddle key, \$1000 the lot. Will not sell separately. VK4PO. Ph. (07) 399 9860.

Kylocat Transceiver, 144 to 148 MHz, five months old, perfect condition, \$275. Ph. (02) 760 3354.

Complete Station. Yaseu PRDX400/FLDX400/FLDX 2000. Excellent condition, handbuilt, matching speaker, \$750. VK3BAX, QTHR. Ph. (055) 95 949 or 97401 AM.

SB101, 10 to 30m: Heathkit SSB transceiver, not working, external power supply, speaker box and transceiver cabinet etc. in very good condition. Transceiver needs work done to it, \$150 the lot. Bert. (02) 42 5312, AM 258 4086.

1 Barker-Wadley RX XORI-30 mark, \$175. 1 Drake SBR1, \$550. Both under warranty. D. Deernan, 222 Jarry St., Cherliffe, 4470.

One Philips type SVC 100L, manufactured for US Navy. Freq 1.9 MHz to 21 MHz continuous plug-in units, good for RTTY, all ceramic TNS High Q circuitry. Spcl \$13 with 2 match, manual, large auto atcher, AF, mains, 80 to 200A, \$220. Also over 200 tubes. VK3LC, QTHR. Ph. (08) 71 6841.

75 R. ex BGA lower (self supporting), can be raised to any height to 70 ft: diamond and w.c. m. \$200. Hy-gain TH60XK GEL tri-band w.c. m. only manual, \$200. VK2DD, QTHR. Ph. (03) 45 5365.

Hybrid quad antenna, 6-10-15 and 160m, DX performance, \$25; HFO-M RB, 88 watt, 10 to 30 MHz, C/W 60W P/S, \$65; 40W CW TX, 10 to 30 MHz, self contained, \$45; Weston model E772 analyzer test meter, 20,000 ohms/volt, \$40; low voltage bench supply, 0V to 15V, 500 mA output, \$15; G/C protected, \$25; Woden Unit modulation transformer, \$12; transistors JAN2N657, \$4; JAN2N1450, \$12. Please add little extra for freight. VK2BZF, 90 Wyong Rd, Killenay Vale, NSW, 2281. Ph. (043) 32 5758.

Galaxy HF 10-40m, 440 W input SSB transceiver, with Galaxy remote VFO, Galaxy speaker console, At. supply, mic, owner's manual, exc cond, very reliable transceiver, manufactured in USA, \$475. Geoff Dawey. Ph. (02) 389 6616 Bus., (02) 337 6379 AM.

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SILENT KEYS

It is with deep regret that we record the passing of —

Mr. L. A. KELBALL
Mr. THOMAS B. HOGAN

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Collins inverter, solid state, 25V DC to 115V AC, 400 Hz at 100W, type 485A-2, C/W circuit, power plug units 6167-3, \$50. ONO. VK3WV, QTHR. Ph. (033) 44 2761.

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Yaseu FT191B, exc cond, all accessories, \$375; Genetronics GT3335B CB txcvr, SSB/AM, \$150; IC502 6m SSB 3W PEP txcvr, \$178; IC215 2m FM 3W txcvr, repts 2.6, Simp's tx cvr, 40, 49, 50, 61, 65, \$300; AWA MR8A car phone conv to 6m FM, 25W output, with 52.625 and 62.655 MHz, \$60; TCA 6m AM txcvr, with 53.025, 53.100 and 53.250 MHz, \$40; Hamlin RX AM, CB, PM, AM, tune to 160m, \$112; Midland 13/698 CB 1W txcvr, brand new with cha. 11 and 14, \$42; Panoramic adapter, alg copra, BC1031A, 40; 2 transformers, 25-0.28V at 30 amps, and 10V at 5 amps, \$25 for both. Contact L. Curling VK3MA, QTHR. Ph. (03) 58 3710 (after hours), (03) 320 7888 (business hours).

WANTED

Information or references on the subject of fan-stator aging. VK7EM, QTHR.

Crystals for Tracer Noval 3570, 4025, 3540, 3985 kHz or advice where is cheapest source. Rodney VKANBC, 15 Alice St., Dalby, 4405. Ph. (074) 62 1294.

Small HF Transceiver for mobile use. Atlas, Swan or similar, 8/35 unit. Small triband HF yagi rotor. Don VK3KJ, QTHR. Ph. (087) 6 0666.

FT401/560/570 type transceiver. Particulars to VK3OM. QTHR or phone (03) 580 8215.

AR April, May, June, July 1958; October, November, December 1965; January, March, July, 1967. VK2BQJ, QTHR. Ph. (02) 642 0122 bus.

Commercial Digital Frequency Counter, also AM/FM signal generator, Marconi FT 995B/5 or similar. Please advise details and price to VK5T21, Box 251, Mt. Gambier, 5260.

HF Transceiver, second hand, good cond, up to 840W. Preferably FT200, FT101, Swan, etc. Wanted for new VL Novice Licensee. Please contact Steve VK2BGL, QTHR. Ph. (047) 54 1096.

10 V self-supporting, on-air-up, tilt-over tower. Price and details to Mike VK1VW, 13 DeChair St., Deskin, ACT. Ph. (062) 81 1312.

I would be interested in hearing from anyone who has constructed, is constructing or is considering constructing any of the multimode transceivers as described in the Pleasay publication "S800 Series Transceiver Applications" and similar publications. G. Gross VK2ZZZ, 29 Hawkeck St., Mayfield, 2304.

Old-timer, inactive since 1947, making come-back and would appreciate any unwanted copies of AR, QST and the like. No matter how old. Will be thankfully received and all postal charges incurred will be refunded. Mac Cormack VK2ARK, 149 Albany St., Harden, 2587.

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